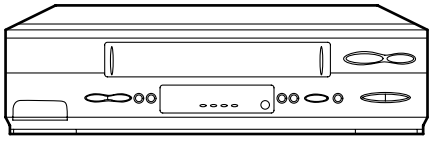
SHARP SERVICE MANUAL

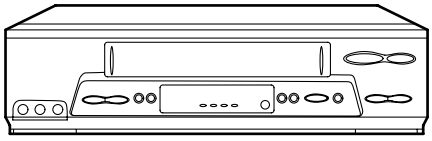
S62K7VC-A560U

SUPPLEMENT



VC-A560U(A)/A560U/A560U(B)
VC-H960U/H960U(B)

VHS VIDEO CASSETTE RECORDER



VC-H961U

MODELS

VC-A560U(A)
VC-A560U/A560U(B)
VC-H960U/H960U(B)
VC-H961U

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified be used.

OUTLINE

This Supplement describes corrections of the mechanism in the VC-A560U(A)/A560U/A560U(B)/H960U/H960U(B)/H961U Service Manual already issued. For the items which are not described in this Supplement, refer to the VC-A560U(A)/A560U/A560U(B)/H960U/H960U(B)/H961U Service Manual (S3292VC-A560U).

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VC-A560U/H960U/H961U ..... Models for Canada
VC-A560U(A)/A560U/A560U(B)/H960U/H960U(B) ..... Models for U.S.A

SHARP CORPORATION

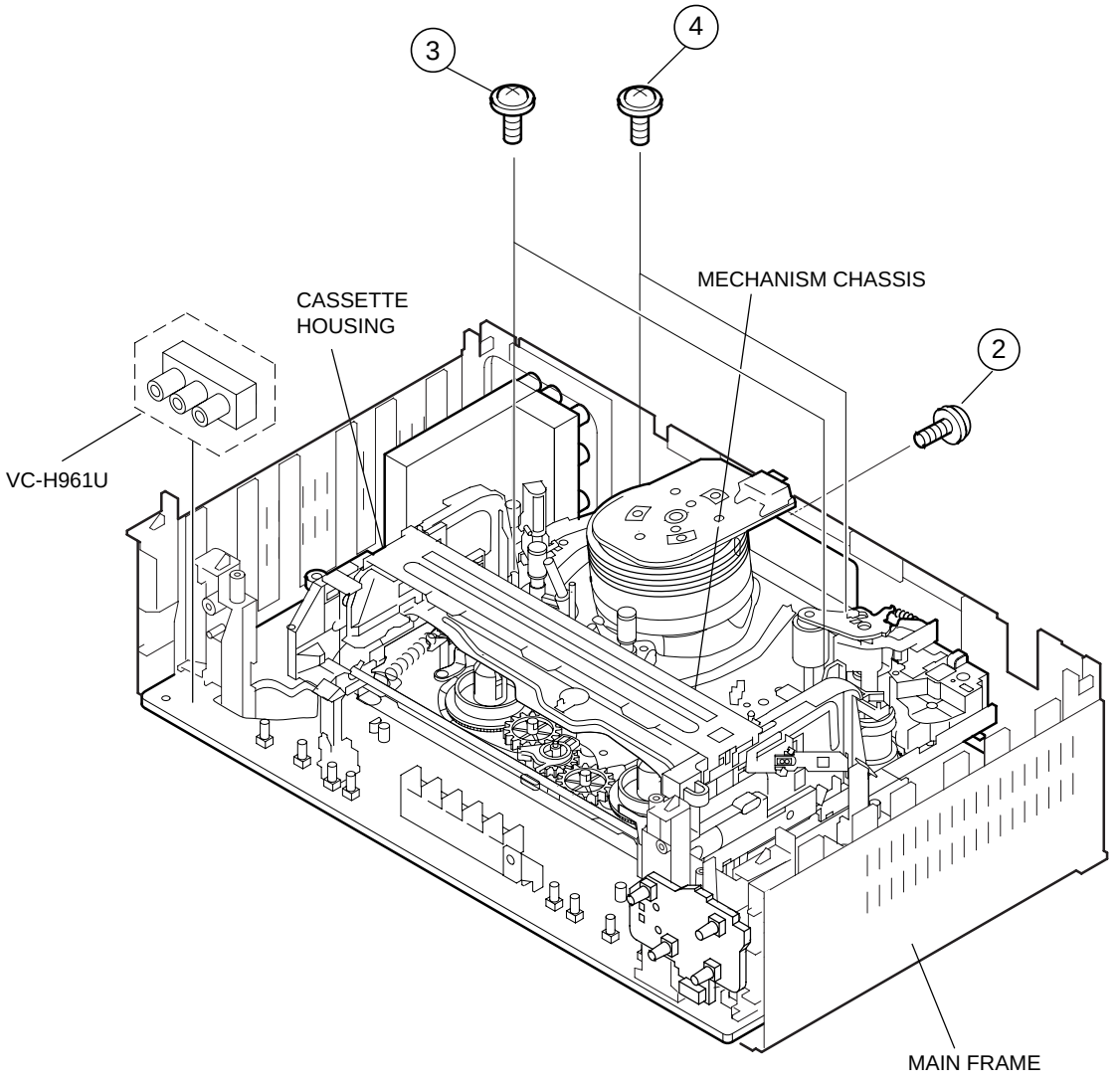
This document has been published to be used for after sales service only.
The contents are subject to change without notice.

2. DISASSEMBLY AND REASSEMBLY

2-2 DISASSEMBLING THE MECHANISM

1. When removing the mechanism from the set.
   Remove the screw ② which connecting the PWB and the mechanism.
   Remove the screw ④ which connecting mechanism and main frame.
   Take out vertically the mechanism so that it does not damage the adjacent parts.

2. Removing the mechanism and cassette housing.
   Remove 2 screws ③ fixing the cassette housing to the mechanism, and remove the cassette housing.



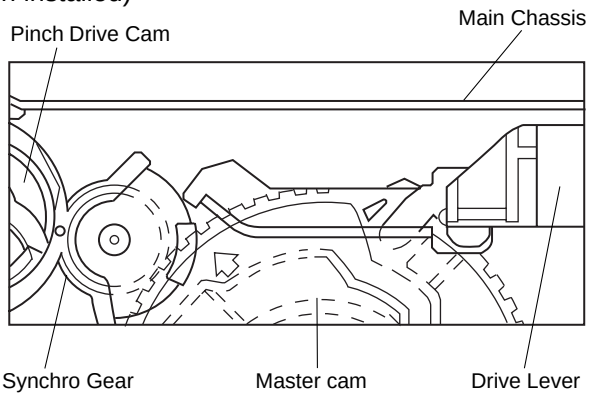
2-3 CARES WHEN REASSEMBLING

INSTALLING THE CASSETTE HOUSING

When the cassette housing is installed on the mechanism, the initial setting is essential condition.
There are two initial setting methods, namely electrical and mechanical.

1. Electrical initial setting

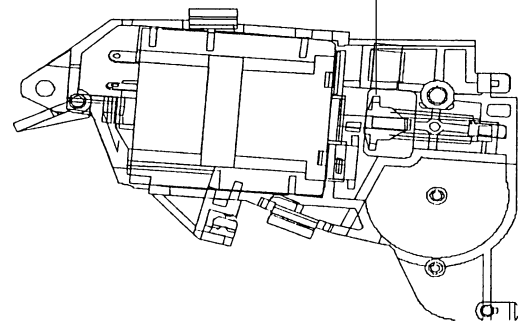
So as to perform initial setting of mechanism execute the Step 1 of Installation of cassette housing. After ascertaining the return to the initial setting position install the cassette housing. (Conditions: When mechanism and PWB have been installed)



2. Mechanical initial setting

- Rotate the worm gear by pushing the flange manually until return to initial position.

Rotate the flange of worm gear by using thin stick.
CW •••Loading direction
CCW •••Ejection direction
Note
Be careful not to damage the gear of worm gear and worm wheel gear. It might cause a strange sound.



- When apply power supply to rotate the loading motor, please remove/unsolder at least one terminal wire.
- If voltage applied to loading motor without disconnecting the terminal wire, there is a possibility the capstan motor IC will damage.
- The maximum applied voltage is 9V. If more than 9V, there is a possibility the mechanism will damage.
- After ascertaining the return to the initial set position install the cassette housing in the specified position. (This method is applied only for the mechanism.)

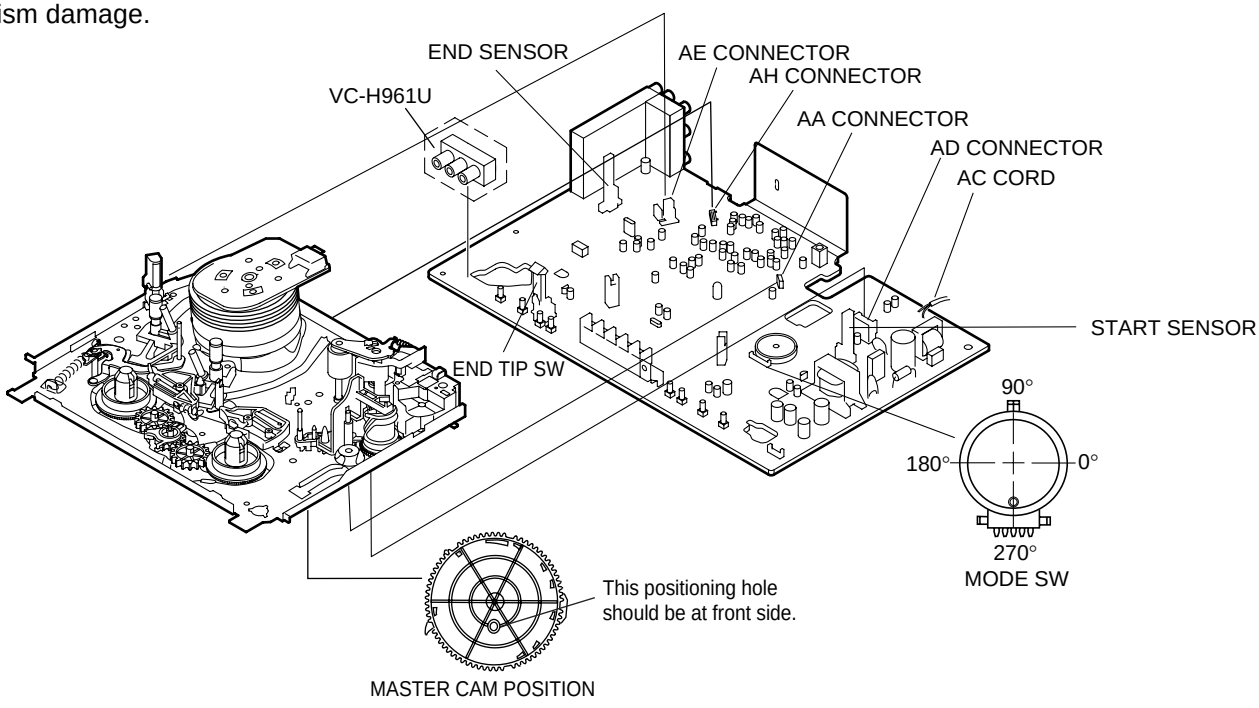
INSTALLING THE MECHANISM ON PWB

Lower vertically the mechanism, paying attention to the mechanism edge mode SW position, (Set the mode SW position to 270° and make sure the master cam position hole also in 270° position) and install the mechanism with due care so that the parts are not damaged.

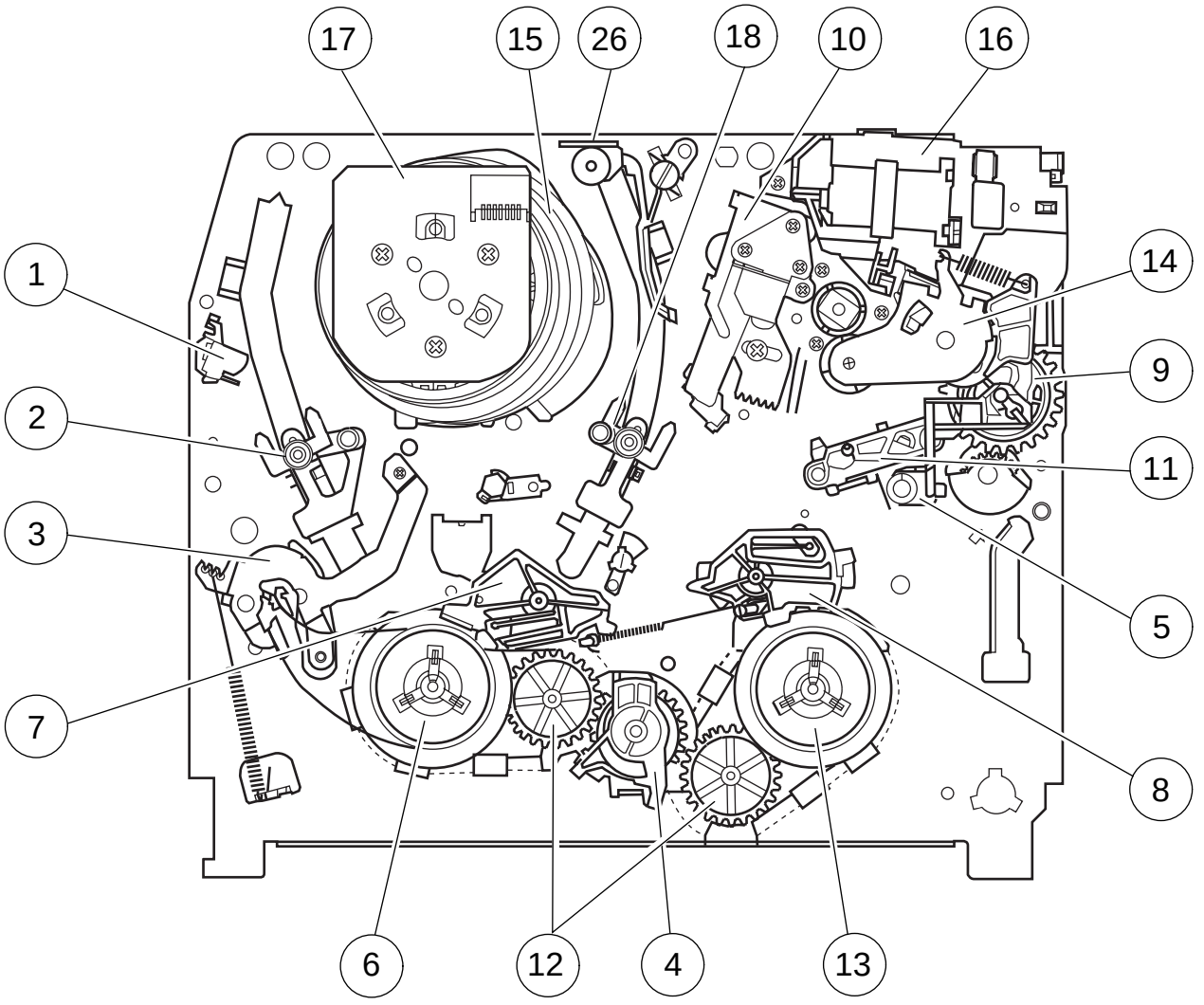
* Please make sure to insert correctly.
  If not, strange moving will occur and will couse mechanism damage.

PARTS WHICH NEED PARTICULAR CARE

When installing the mechanism chassis on the PWB unit, take care so as to prevent deformation due to contact of mechanism chassis with REC TIP SW.

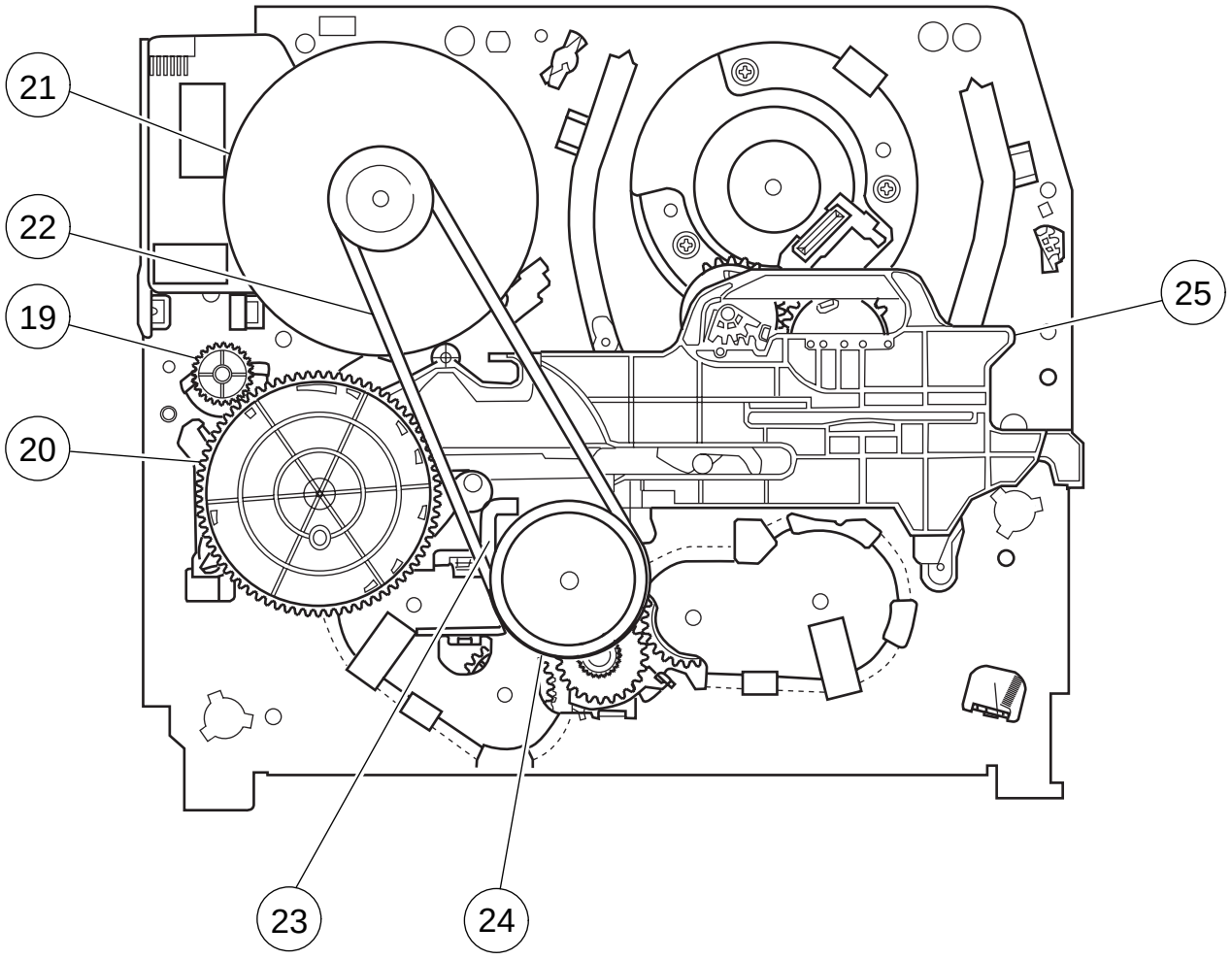


3. FUNCTION OF MAJOR MECHANICAL PARTS (TOP VIEW)



No.	Function	No.	Function
1	Full erase head	11	Reverse guide lever ass'y
2	Supply pole base ass'y	12	Reel relay gear
3	Tension arm	13	Take-up reel disk
4	Idler wheel ass'y	14	Pinch roller lever ass'y
5	Open guide	15	Drum ass'y
6	Supply reel disk	16	Loading motor block
7	Supply main brake	17	Drum driver motor
8	Take-up main brake	18	Take-up pole base ass'y
9	Pinch drive cam	26	Auto head cleaner Ass'y
10	A/C head ass'y		

FUNCTION OF MAJOR MECHANICAL PARTS (BOTTOM VIEW)



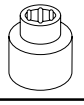
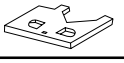
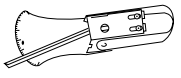
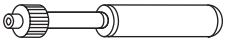
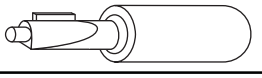
No.	Function	No.	Function
19	Syncro Gear	23	Clutch lever
20	Master cam	24	Limiter pulley ass'y
21	Capstan D.D. motor	25	Shifter
22	Reel belt		

4. ADJUSTMENT, REPLACEMENT AND ASSEMBLY OF MECHANICAL UNITS

The explanation given below relates to the on-site general service (field service) but it does not relates to the adjustment and replacement which need high-grade equipment, jigs and skill. For example, the drum assembling, replacement and adjustment service must be performed by the person who have finished the technical courses.

4-1 MECHANISM CONFIRMATION ADJUSTMENT JIG

So as to perform completely the mechanism adjustment prepare the following special jigs. So as to maintain the initial performance of the machine the maintenance and check are necessary. Utmost care must be taken so that the tape is not damaged. If adjustment needs any jig, be sure to use the required jig.

No.	Jig Item	Part No.	Code	Configuration	Remarks
1.	Torque Cassette Meter	JiGVHT-063	CZ		This cassette torque meter is used for checking and adjusting the torque of take-up for measuring tape back tension.
2.	Torque Gauge	JiGTG0090	CM		These Jigs are used for checking and adjusting the torque of take-up and supply reel disks.
		JiGTG1200	CN		
3.	Torque Gauge Head	JiGTH0006	AW		
4.	Torque Driver	JiGTD1200	CB		When fixing any part to the threaded hole using resin with screw, use the jig. (Specified torque 5 kg)
5.	Master Plane Jig and Reel Disk Height Adjusting Jig	JiGRH0002	BR		These Jigs are used for checking and adjusting the reel disk height.
		JiGMP0001	BY		
6.	Tension Gauge	JiGSG2000	BS		There are two gauges used for the tension measurements, 300 g and 2.0 kg.
		JiGSG0300	BF		
7.	Pinch pressing force measuring jig	JiGADP003	BK		This Jig is used with the tension gauge. Rotary transformer clearance adjusting jig.
8.	Alignment Tape				These tapes are especially used for electrical fine adjustment.
		VROATSV	CD		525 Monoscope: Audio 7k, HiFi Audio —, Track 58µm NTSC Color Bar: Audio 1k, HiFi Audio —, Track 58µm
		VROEFZCS OR VROEFZHS	BG		Black Level (only SYNC) signal: Audio 1k, HiFi Audio —, Track 19µm
			BH		Audio 2.3k
9.	Guide roller height adjustment driver	JiGDRiVERH-4	AP		This screwdriver is used for adjusting the guide roller height.
10.	X value adjustment gear driver	JiGDRiVER-6	BM		For X value adjustment
11.	Tension Pole Adjustment Driver	JiGHMEC-M005	CK		This Jig is used for adjustment of tension pole.

4-2 MAINTENANCE CHECK ITEMS AND EXECUTION TIME

Perform the maintenance with the regular intervals as follows so as to maintain the quality of machine.

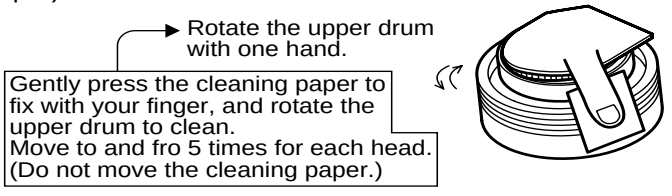
Maintained / Parts	500 hrs.	1000 hrs.	1500 hrs.	2000 hrs.	Possible symptom encountered	Remarks
Guide roller ass'y	□	□	□	□	Lateral noises Head occasionally blocked	Abnormal rotation or significant vibration requires replacement.
Sup guide shaft	□	□	□	□		Clean tape contact part with the specified cleaning liquid.
Reverse guide	□	□	□	□		
Slant pole on pole base	□	□	□	□		
Full erase head	□	□	□	○	Colour and beating	Clean tape contact area with the specified cleaning liquid.
A/C head	□	□	□	○	Small sound or sound distortion	
Upper and lower drum ass'y	□	○□	○□	○□	Poor S/N ratio, no colour Poor flatness of the envelope with alignment tape	
Capstan D.D. motor	□	□	□	□	No tape running, uneven colour	
Pinch roller	□	□	□	□	No tape running, tape slack	Clean rubber and rubber contact area with the specified cleaning liquid.
Reel belt		□		○	No tape running, tape slack, no fast forward/ rewind motion	
Tension band ass'y				○	Screen swaying	
Loading motor				○	Cassette not loaded or unloaded	
Idler ass'y				○	No tape running, tape slack	
Limiter pulley		□△		□○		
Supply/take-up main brake levers				○	Tape slack	

NOTE ○ : Part replacement. □ : Cleaning △ : Apply grease
<Specified> Cleaning liquid Industrial ethyl alcohol

* This mechanism does not need electric adjustment with variable resistor. Check parts. If any deviation is found, clean or replace parts.

Video head cleaning procedure

1. Apply one drop of cleaning liquid to the cleaning paper with the baby oiler.
2. Gently press the cleaning paper against the video head to fix your finger, and move the upper drum so that each head is passed to and fro 5 times (do not move the cleaning paper).
3. Wipe with the dry cleaning paper.


Rotate the upper drum with one hand.
Gently press the cleaning paper to fix with your finger, and rotate the upper drum to clean.
Move to and fro 5 times for each head.
(Do not move the cleaning paper.)

Notes :

- Use the commercially available ethanol of Class 1 as cleaning liquid.
- Since the video head may be damaged, do not move up and down the cleaning paper.
- Whenever the video head is cleaned, replace the cleaning paper.
- Do not apply this procedure for the parts other than the video head.

Parts Code	Description	Code
ZPAPRA56-001E	Cleaning Paper	AW
ZOiLR-02-24TE	Babe Oiler (Spoit)	AH

4-3 REMOVING AND INSTALLING THE CASSETTE HOUSING

• Removal

1. In the cassette removing mode, remove the cassette.
2. Unplug the power cord.
3. Remove in the following numerical order.
   a) Remove two screws ①.
   b) Pull and circle the drive lever and pull up the cassette housing control.

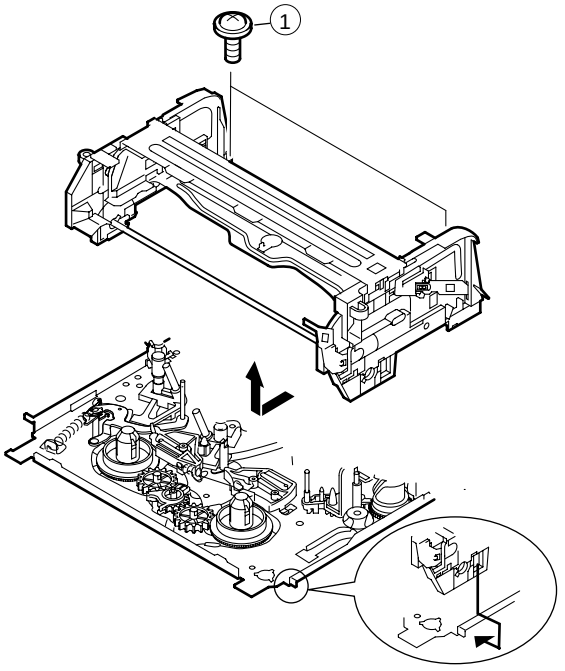


Figure 4-1.

• Reassembly

1. Before installing the cassette housing control, short-circuit between TP803 and TP802 provided at main PWB, press the eject button. The master cam turns and stop in eject position. Fit the drive lever to master cam through main chassis, push down and slide the drive lever towards to master cam.
   *Eject position: Pinch Drive Cam positioning hole parallel to center of Synchro Gear (Synchro gear marking line). Synchro Gear positioning mark parallel to center of master cam.

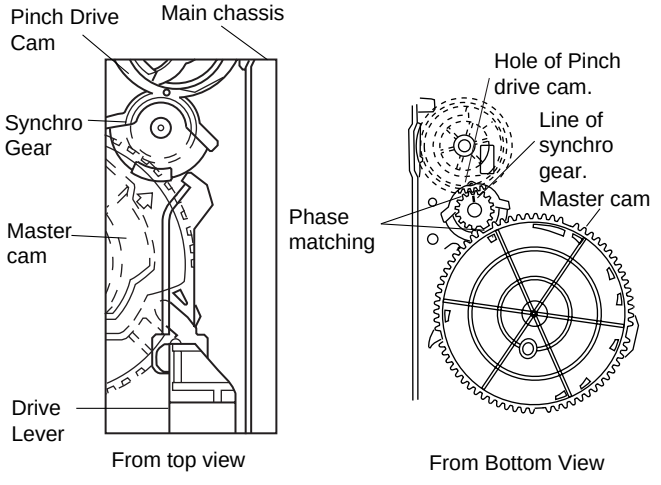


Figure 4-2.

2. Install in the reverse order of removal.

Notes

1. In the case when you use the magnet screw driver, never approach the magnet driver to the A/C head, FE head, and drum.
2. When installing or removing, take care so that the cassette housing control and tool do not contact the guide pin or drum.
3. After installing the cassette housing control once perform cassette loading operation.

4-4 TO RUN A TAPE WITHOUT THE CASSETTE HOUSING CONTROL ASSEMBLY

1. Remove the full-surface panel.
2. Short-circuit between TP803 and TP802.
3. Plug in the power cord.
4. Turn off the power switch.
   (The pole bases move into U.L.position.)
5. Open the lid of a cassette tape by hand.
6. Hold the lid with two pieces of vinyl tape.
7. Set the cassette tape in the mechanism chassis.
8. Stabilize the cassette tape with a weight (500g) to prevent floating.

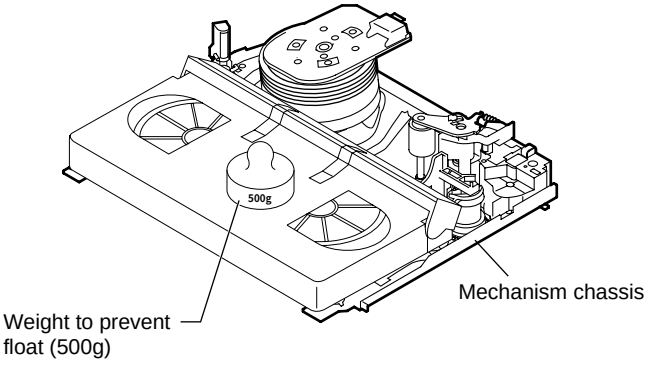


Figure 4-3.

9. Turn on the power switch.
10. Perform running test.

Note:
The weight should not be more than 500g.

To take out the cassette tape.

1. Turn off the power switch.
2. Take out the cassette tape.

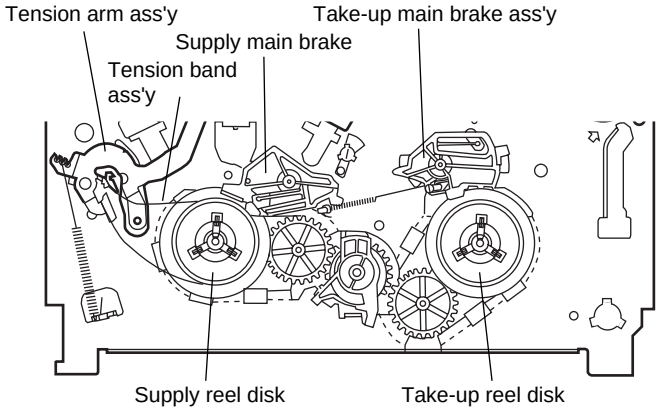
4-5 REEL DISK REPLACEMENT AND HEIGHT CHECK

- **Removal**

1. Remove the cassette housing control assembly.
2. Remove the Supply/Take-up main brake ass'y.
3. Remove tension band from the tension arm ass'y.
4. Remove the reel disk.

Note:

Take care so that the tension band ass'y and main brake ass'y are not deformed.



- **Reassembly (Supply reel disk)**

1. Clean the reel disk shaft and apply grease (SC-141) to it.
2. Match the phases of reel disk and reel relay gear, and set the new reel disk.
3. After checking the reel disk height, wind the tension band ass'y around the reel disk, and hook to tension arm ass'y.
4. Assemble the Supply main brake ass'y.

Notes:

1. When installing the reel disk, take due care so that the tension band ass'y is not deformed and grease does no adhere.
2. Do not damage the Supply main brake ass'y. Be careful so that grease does not adhere to the brake surface.

- **Reassembly (Take-up reel disk)**

1. Clean the reel disk shaft and apply grease (SC-141) to it.
2. Align the phase of the reel disk to that of the reel relay gear and to install a new take-up reel disk onto the shaft.
3. Check the reel disk height and reassemble the take-up main brake ass'y.

Note:

1. Take care so that the Take-up main brake ass'y is not damaged. Take care so that grease does not adhere the brake surface.
2. After reassembly, check the video search rewind back tension (see **4-10**), and check the brake torque (see **4-14**).

- **Height checking and adjustment**

Note:

1. Set the master plane with due care so that it does not contact the drum.
2. When putting the master plane, shift the reverse guide a little in the loading direction. Care must be taken since excessive shift results in damage.

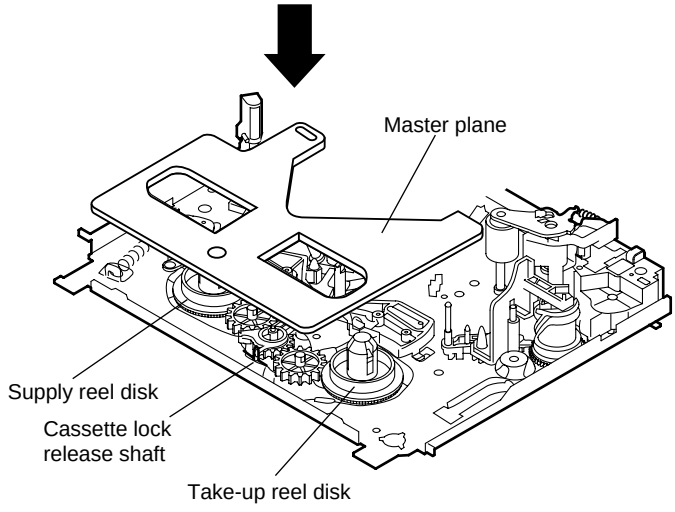


Figure 4-4.

Note:

- Check that the reel disk is lower than part A but higher than part B. If the height is not correct, readjust the reel disk height by changing the poly-slider washer under the reel disk.

Note:
Whenever replacing the reel disk, perform the height checking and adjustment.

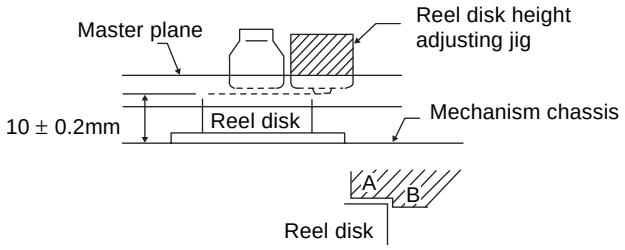


Figure 4-5.

4-6 CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN FAST FORWARD MODE

- **Remove the cassette housing control assembly.**

- **After short-circuiting between TP803 and TP802 provided at operation PWB, plug in the power cord.**

- **Setting**

1. Set a torque gauge to zero on the scale. Place it on the take-up reel disk.
2. Press the FF button.
3. To calculate the remaining capacity of the play back mode, slowly rotate the supply reel disk, and then shift it into the forward mode.

- **Checking**

1. Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the CW direction.
2. Make sure that the indication of torque gauge is not less than 25mN·m (255gf·cm).

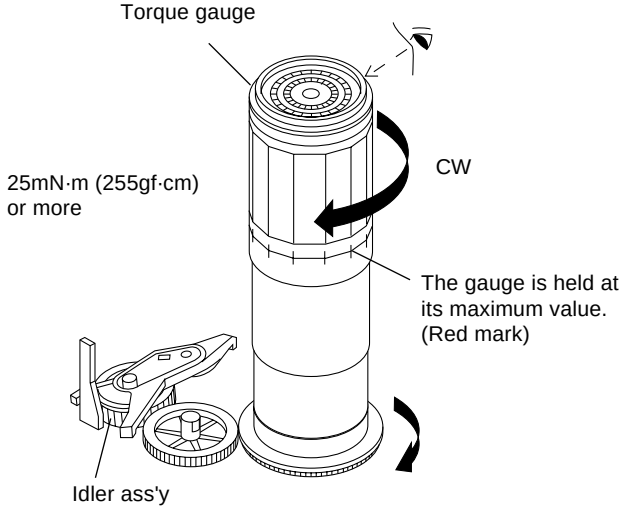


Figure 4-6.

- **Adjustment**

1. If the FF winding-up torque is less than the specified value, clean the capstan D.D. pulley, reel belt, and limiter pulley with cleaning liquid, and check again.
2. If the torque is less than the set value, replace the reel belt.

Notes:
1. Hold the torque gauge by hand so that it is not moved.
2. Do not keep the reel disk in lock state. Do not allow long-time measurement.

4-7 CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN REWIND MODE

- **Remove the cassette housing control assembly.**

- **After short-circuiting between TP803 and TP802 provided at operation PWB, plug in the power cord.**

- **Setting**

1. Set a torque gauge to zero on the scale. Place it on the supply reel disk.
2. Press the rewind button.
3. To calculate the remaining capacity, slowly rotate the take-up reel disk, and then shift it into the rewind mode.

- **Checking**

1. Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the CCW direction.
2. Make sure that the indication of torque gauge is not less than 25mN·m (255gf·cm).

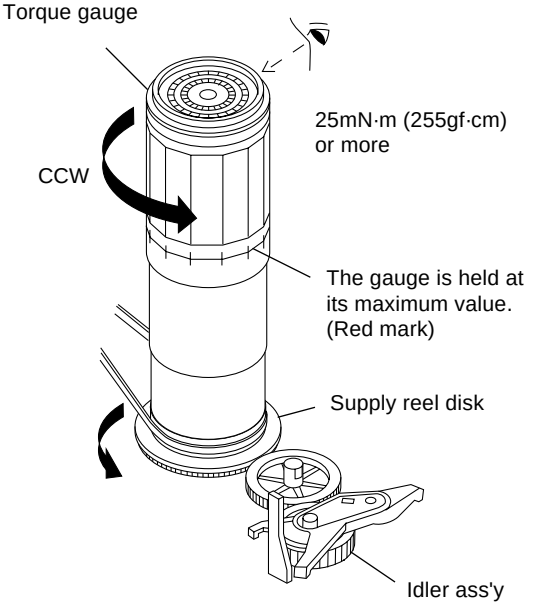


Figure 4-7.

- **Adjustment**

1. If the rewind winding-up torque is less than the specified value, clean the capstan D.D. pulley, reel belt, and limiter pulley with cleaning liquid, rewind again, and check the winding-up torque.
2. If the winding-up torque is still out of range, replace the drive belt.

Notes:
1. Hold the torque gauge by hand so that it is not moved.
2. Do not keep the reel disk in lock state. Do not allow long-time measurement.

4-8 CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN RECORD/PLAYBACK MODE

- **Remove the cassette housing control assembly.**
- **After short-circuiting between TP803 and TP802 provided at operation PWB, plug in the power cord.**
- **Turn off the power switch.**
- **Open the cassette torque meter lid, and fix it with tape.**
- **Load the cassette torque meter into the unit.**
- **Put the weight (500g) on the cassette torque meter.**
- **Turn on the power switch.**
- **Press the picture record button, and set EP picture record mode (x3).**

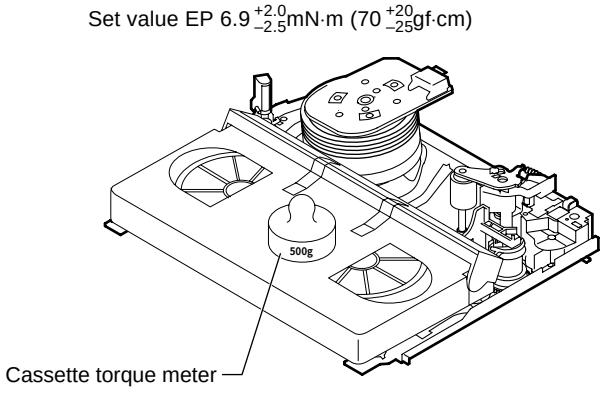


Figure 4-8.

- **Checking**

1. Make sure that value is within the setting 6.9 $^{+2.0}_{-2.5}$mN·m (70$^{+20}_{-25}$gf·cm).
2. The winding-up torque fluctuates due to variation of rotation torque of limiter pulley ass'y. Read the center value of fluctuation as setting.
3. Set the EP record mode (x3) and make sure that the winding-up torque is within setting.

- **Adjustment**

If the playback winding-up torque is not within the setting, replace the limiter pulley assembly.

Note:
When the torque cassette is set, put a weight (500g) to prevent rise.
When the cassette torque meter is taken out.
Turn off the power switch.

4-9 CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN VIDEO SEARCH REWIND MODE

- **Remove the cassette housing control assembly.**
- **After short-circuiting between TP803 and TP802 provided at operation PWB, plug in the power cord.**
- **Setting**

Press the playback button and rewind button to set the video search rewinding mode.

- **Checking**

Place the torque gauge on the supply reel disk, and turn it counterclockwise very slowly (one rotation every 1 to 2 seconds) and check that the torque is within the set value 14.1 ± 3.5mN·m. (144 ± 35gf·cm)

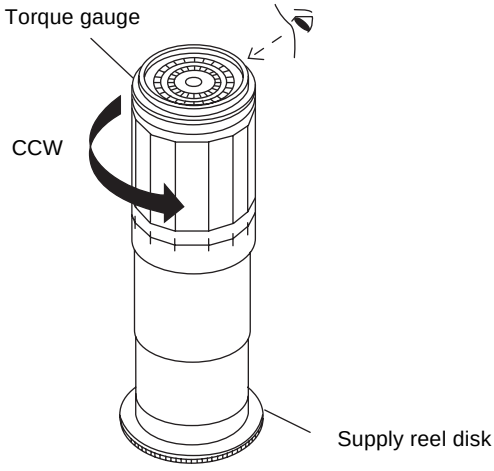


Figure 4-9.

Note:
Surely put the torque gauge on the reel disk to measure. If the torque gauge is raised, accurate measurement is impossible.

- **Adjustment**

If the rewinding playback winding-up torque is not within the setting, replace the limiter pulley assembly.

Note:
The winding-up torque fluctuates due to variation of rotation torque of supply reel disk. Read the center value of fluctuation as setting.

4-10 CHECKING THE VIDEO SEARCH REWIND BACK TENSION

- **Remove the cassette housing control assembly.**
- **After short-circuiting between TP803 and TP802 provided at main PWB, plug in the power cord.**
- **Checking**

1. After pressing the play button, press the rewind button, and set the video search rewind mode.
2. Place the torque gauge on the take-up reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within the set value 3.7 ± 1.5mN·m (38 ± 15gf·cm).

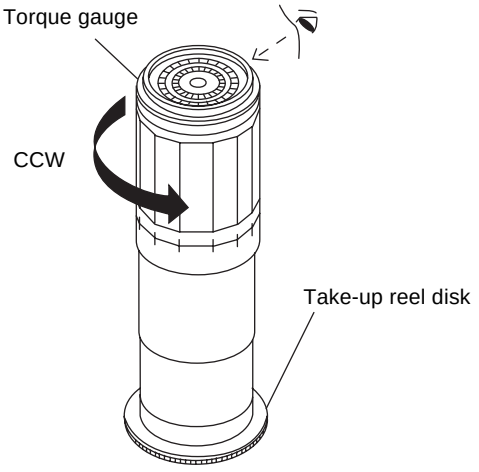


Figure 4-10.

Notes:
Set the torque gauge securely on the take-up reel disk. If it is not secure, the measurement will be incorrect.

4-11 CHECKING THE PINCH ROLLER PRESSURE

*** Checking can be perform with or without cassette housing contorl.**

- **Remove the cassette housing control assembly.**
- **After short-circuiting between TP803 and TP802 provided at main PWB, plug in the power cord.**
- **Checking**

Press the play button to set the playback mode.

1. Detach the pinch roller from the capstan shaft. Do not separate excessively. Or the pinch lever and pinch double action lever may disengage.
2. Engage the tension gauge adapter with the pinch roller shaft, and pull in the arrow direction.
3. Gradually return the pinch roller, and measure the pulling force when the pinch roller contacts the capstan shaft.
4. Make sure that the measured value is within setting change to 9.8 ± 2N (1.0 ± 0.2kgf).

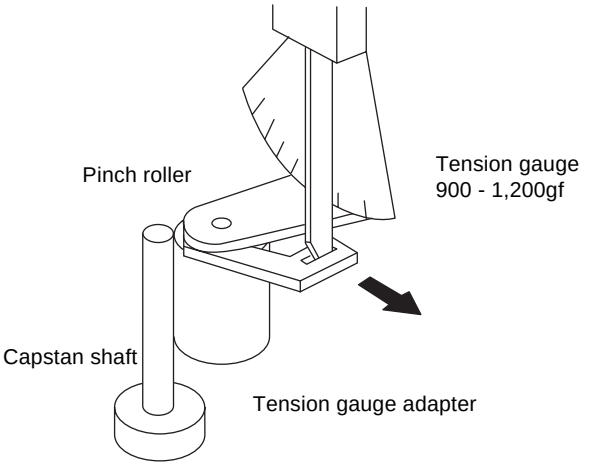


Figure 4-11.

4-12 CHECKING AND ADJUSTMENT OF TENSION POLE POSITION

*** Checking can be perform with or without cassette housing contorl.**

- **Remove the cassette housing contorol assembly.**
- **After short-circuiting between TP803 and TP802 provided at main PWB, plug in the power cord.**
- **Setting (with cassette housing contorl)**

1. Turn off the power switch.
2. Open the cassette tape (T-120), and fix with tape.
3. Set the cassette tape in loading state.
4. Put the weight (500g) on the cassette tape.
5. Turn on the power switch.
6. Make the adjustment with the beginning of a T-120 tape.

- **Setting (with cassette housing contorl)**

1. Insert cassette tape (T-120)
2. Make the adjustment with the beginning of a T-120 tape.

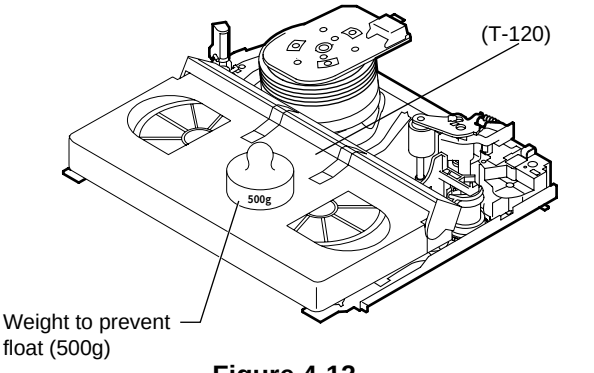
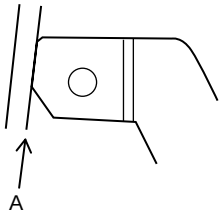


Figure 4-12.

- **Checking**

1. Set a cassette tape, push the REC button to place the unit in the SP record mode. Now check the tension pole position.
2. Visually check to see if the position of the tension pole is within the $0^{+0.5}_{-0.2}$ mm from the left side line.

Standard A = $0^{+0.5}_{-0.2}$ mm



Make the adjustment with the beginning of a T-120 tape.

Figure 4-13.

At left side from the reference line. (A).

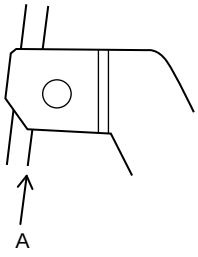


Figure 4-14.

Insert the tension pole adjustment driver to main chassis hole, and rotate counterclockwise.

At right side from the reference line. (A).

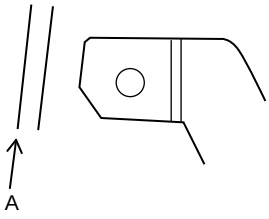


Figure 4-15.

Insert the tension pole adjustment driver to main chassis hole, and rotate clockwise.

Tension pole adjustment driver adjusting direction

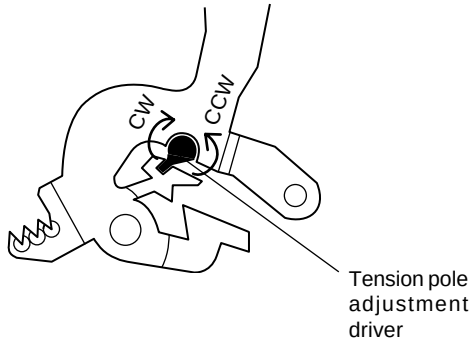


Figure 4-16.

4-13 CHECKING AND ADJUSTMENT OF RECORD/PLAYBACK BACK TENSION

*** Checking can be perform with or without cassette housing contorl.**

- **Remove the cassette housing contorol assembly.**
- **After short-circuiting between TP803 and TP802 provided at main PWB, plug in the power cord.**

- **Setting (with cassette housing contorl)**

1. Turn off the power switch.
2. Open the cassette torque meter and fix with tape.
3. Set the cassette torque meter in loading state.
4. Put the weight (500g) on the cassette torque meter.
5. Turn on the power switch.

- **Setting (with cassette housing contorl)**

1. Insert cassette torque meter.

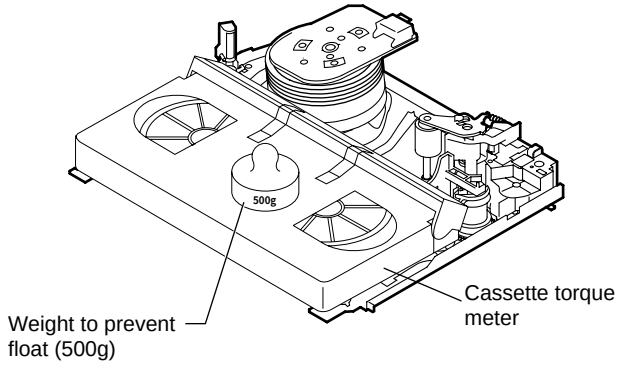


Figure 4-17.

- **Checking**

1. Push the REC button to place the unit in the SP record mode.
2. At this time ascertain that the back tension is within the setting 3.9 to 5.5mN·m (40 to 56gf·cm) by seeing the indication of torque cassette meter.

- **Adjustment**

1. If the indication of torque cassette meter is lower than the setting, shift the tension spring engagement to the part A.
2. If the indication of torque cassette meter is higher than the setting, shift the tension spring engagement to the part B.

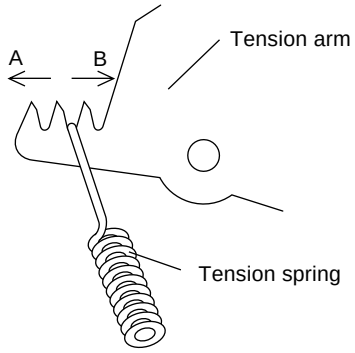
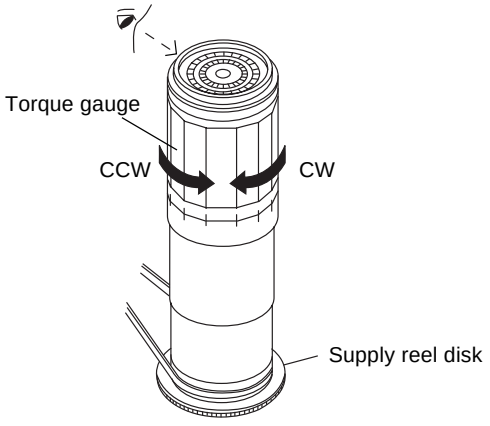


Figure 4-18.

4-14 CHECKING THE BRAKE TORQUE

- **Checking the brake torque at the supply side**



CCW:	$4.41 \pm^{+2.0}_{-1.5}$ mN·m ($45 \pm^{+20}_{-15}$ gf·cm)
CW:	$4.12 \pm^{+1.5}_{-1.2}$ mN·m ($42 \pm^{+15}_{-12}$ gf·cm)

Figure 4-19.

- **Remove the cassette housing control assembly.**

- **After short-circuiting between TP803 and TP802 provided at main PWB, plug in the power cord.**

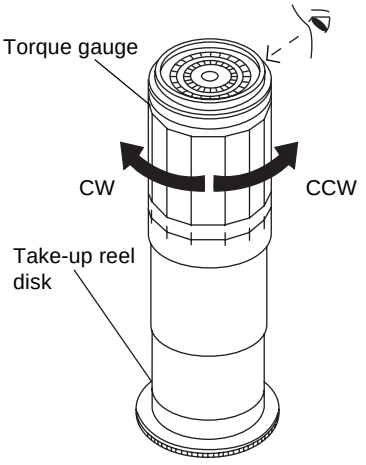
- **Setting**

1. Set a torque gauge to zero on the scale. Place it on the supply reel disk.
2. Switch from the FF mode to the STOP mode.
3. Disconnect the power cord.
4. Please check Idler gear not contact with reel relay gear (SU side)

- **Checking**

Turn the torque gauge at a rate of about one turn/2 sec in the CW direction/CCW direction with respect to the supply reel disk so that the reel disk and torque gauge pointer rotate at equal speed, and make sure that the value is within the setting (CW direction: $4.12 \pm^{+1.5}_{-1.2}$ mN·m (42^{+15}_{-12}gf·cm); CCW direction: $4.41^{+2.0}_{-1.5}$ mN·m (45^{+20}_{-15} gf·cm).

- **Checking the brake torque at the take-up side**



CCW:	$4.41 \pm^{+2.0}_{-1.5}$ mN·m ($45 \pm^{+20}_{-15}$ gf·cm)
CW:	$4.12 \pm^{+1.5}_{-1.2}$ mN·m ($42 \pm^{+15}_{-12}$ gf·cm)

Figure 4-20.

- **Remove the cassette housing control assembly.**

- **After short-circuiting between TP803 and TP802 provided at main PWB, plug in the power cord.**

- **Setting**

1. Switch from the FF mode to the STOP mode.
2. Disconnect the power cord.
3. Set a torque gauge to zero on the scale. Place it on the take-up reel disk.
4. Please check Idler gear not contact with reel relay gear (TU side)

- **Checking**

1. Turn the torque gauge at a rate of about one turn/2 sec in the CCW direction/CW direction so that the reel disk and torque gauge pointer rotates at equal speed and make sure that the value is within the setting (CCW direction: $4.41^{+2.0}_{-1.5}$ mN·m (45^{+20}_{-15} gf·cm), CW direction: $4.12^{+1.5}_{-1.2}$ mN·m (42^{+15}_{-12}gf·cm).

2. Adjustment of the brake torque at the supply side and the take-up side

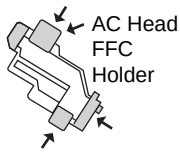
- Unless the supply side brake torque or take-up side brake torque is within the setting, clean the felt surface of reel disk (supply, take-up) brake lever, check again the brake torque.
- If value cannot be set within the setting yet, replace the main brake ass'y or main brake spring.

4-15 REPLACEMENT OF A/C (AUDIO/CONTROL) HEAD

1. In eject position unplug the power cord.

- **Removal**

1. Take out FFC holder from main chassis. (Push 3 hooking point and pull-up the holder).
2. Remove the screws ①②③, Tilt screw.
3. Unsolder the PWB fitted to the A/C head.



Notes:

1. When replacing, never touch the head. If you touched, clean with the cleaning liquid.
2. When removing the screw ③, take care so that the spring may out.

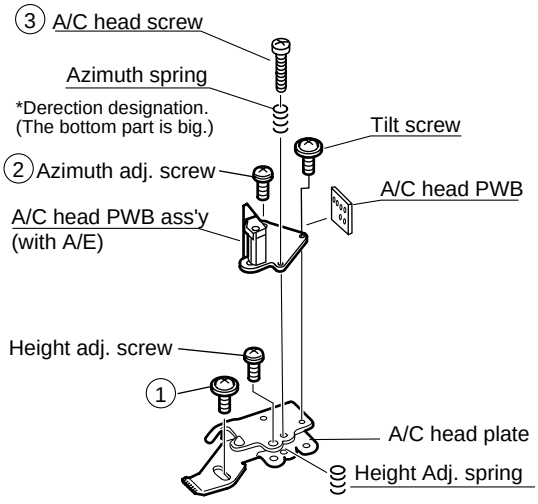


Figure 4-21.

- **Replacement**

1. Solder the removed PWB to the new head assembly.
2. Adjust the height from the A/C head arm (lower surface) to the A/C head plate to 10.8mm with slide calipers. (3 places of azimuth screw section, tilt screw section and A/C head front section) (See the figure below.)

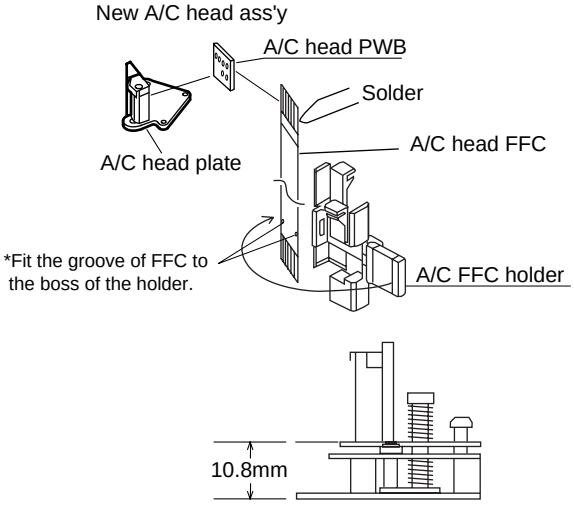


Figure 4-22.

3. Align the left end of gear of A/C head arm with the punched mark of chassis, tentatively tighten the screws ① so as to ensure smooth motion of A/C head arm. Tightening torque must be 0.45 ± 0.05N·m (4.5 ± 0.5kgf·cm).

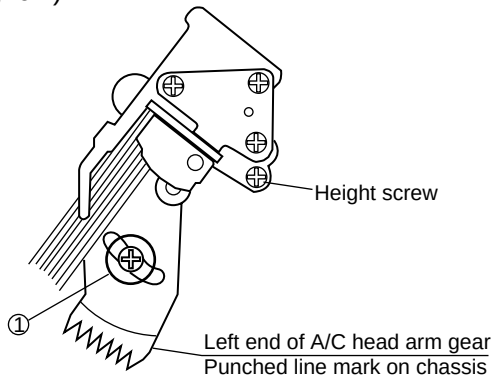


Figure 4-23.

Note:

1. If the screw ① is tighten tentatively too loose, the azimuth and height of A/C head may change when they are finally tightened. Therefore care must be taken.
2. After completion of A/C head be sure to adjust tape running. (Execute the running adjustment by the method described in **4-17**.)

4-16 A/C HEAD HEIGHT ROUGH ADJUSTMENT

- **Setting**

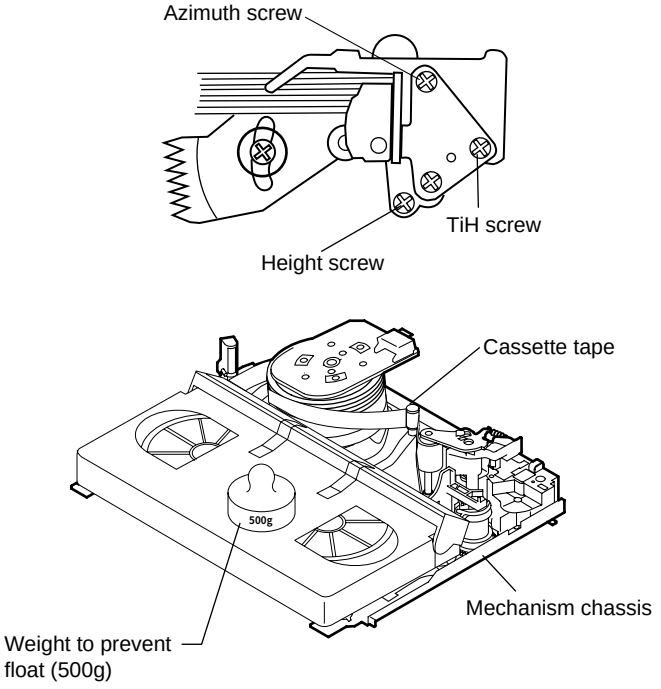


Figure 4-24.

1. Set the cassette tape in the unit.
2. Press the PLAY button to put the unit in the playback mode.
3. Roughly adjust the height of the A/C head by turning the height screw until the tape is in the position shown below.

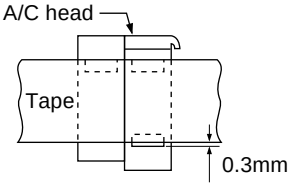


Figure 4-25.

- **Adjustment**

Adjust the height screw visually so that the control head is visible 0.3mm below the bottom of the tape.

4-17 ADJUSTMENT OF TAPE DRIVE TRAIN

1. Tape run rough adjustment
   ① Check and adjust the position of the tension pole. (See **4-12**.)
   ② Check and adjust the video search rewind back tension. (See **4-10**.)
   ③ Connect the oscilloscope to the test point for PB ATR signal output (TP201). Set the synchronism of the oscilloscope to EXT. The PB ATR signal is to be triggered by the head switching pulse (TP202).
   ④ Set the alignment tape (VROATSV) to play.

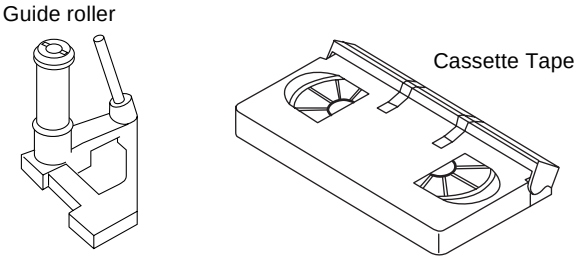


Figure 4-26.

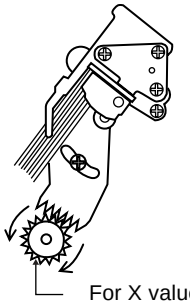
   ⑤ Press the tracking button (+), (–) and change the ATR signal waveform from max to min and from min to max. At this time make sure that the ATR signal waveform changes nearly parallel.
   ⑥ Unless the ATR signal waveform changes nearly parallel, adjust the height of supply side and take-up side guide roller so that the envelope waveform changes nearly parallel. (For ATR signal adjustment procedure refer to Figure 4-30.)
   ⑦ Turn the tilt screw to remove the tape crease at the fixing guide flange.
   Playback the tape and check for tape crease at the fixing guide flange.
   (1) If there is no tape crease
   Turn the tilt screw clockwise so that tape crease appears once at the flange, and then return the tilt screw so that the crease disappears.
   (2) If there is tape crease
   Turn counterclockwise the tilt screw so that the tape crease disappears.
   (Reference) If the tilt screw is turned clockwise crease appears at the lower flange.

Notes:

1. Previously set the tracking control in the center position, and adjust the ATR signal waveform to maximum with X value adjustment nut. Thereby the tape run rough adjustment is facilitated.
2. Especially the outlet side ATR signal waveform must have higher flatness.

Figure 4-27.

2. Adjustment of A/C head height and azimuth
   ① Perform the initial setting of A/C head position by the method stated in "**4-15** Replacement 3".
   ② Connect the oscilloscope to the audio output terminal.
   ③ Using the alignment tape in which 1 kHz linear audio signal has been recorded, adjust the height screw so as to get max audio output.
   ④ Using the alignment tape in which 7 kHz linear audio signal has been recorded, adjust the azimuth screw so as to get max audio output.
   ⑤ The adjustment of ③ and ④ twice or three times repeat, and finally adjust ④.

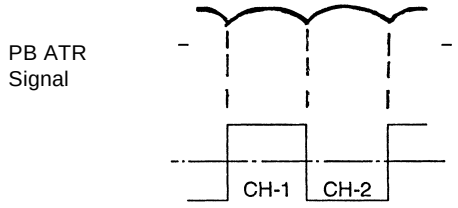


For X value adjustment
Adjust the X value, turning the gear-type screwdriver.

Figure 4-28.

3. Tape run adjustment
   ① Connect the oscilloscope to PB ATR signal output test point, set oscilloscope sync to EXT, trigger-input the PB CHROMA signal (head switching pulse).
   ② Rough adjustment of X value
   Tentatively fix A/C head arm screws ① by the method described in **4-15** "Replacement 3".
   Playback the alignment tape (VROATSV) and shortcircuit between TP801 and TP802. As a result the auto-tracking is automatically cancelled, so that the X value adjustment mode is set.
   Move the A/C head with the X value adjustment gear driver (JiGDRiVER-6) by the method shown in Figure 4-33, and adjust the A/C head so as to get the maximum ATR signal waveform. (Note: When the A/C head is adjusted, adjust so that the maximum ATR signal waveform is obtained nearest the position of initial setting made in **4-15**.)

③ Next, press the tracking button (+), (–) and change the ATR signal waveform from max to min and from min to max. At this time adjust the height of supply and take-up side guide roller with the adjustment driver (JiGDRiVERH-4) so that the ATR signal waveform changes nearly parallel.
④ If the tape is lifted or sunk from the helical lead surface, the PB ATR signal waveform appears as shown in Figure 4-30.
⑤ Press the tracking button (+), (–) and make sure that the ATR signal waveform changes nearly parallel.
⑥ Finally, check tape crease near the reverse guide. If tape crease is found, adjust tilt screw 45˚ counter clockwise. Small tape crcase will appear at retain guide after this adjustment finished.



Head switching pulse

Figure 4-29.

4. A/C head X value adjustment
① Fix A/C head arm screws ① by the method described in **4-15** "Replacement 3".
② Playback the alignment tape (VROATSV), and shortcircuit between TP801 and TP802. As a result the auto-tracking is automatically cancelled, so that the X value adjustment mode is set.

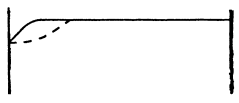
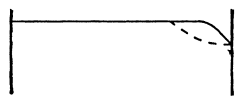
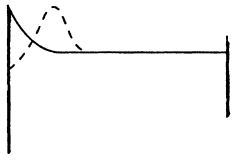
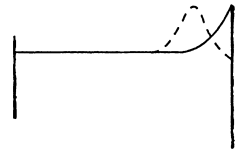
	When the tape is above the helical lead.		When the tape is below the helical lead.	
	Supply side	Take-up side	Supply side	Take-up side
				
				
Adjustment	Supply side guide roller rotated in clockwise direction (lowers guide roller) to flatten ATR signal.	Take-up side guide roller rotated in clockwise direction (lowers guide roller) to flatten ATR signal.	Supply side guide roller rotated in counterclockwise direction (raises guide roller) to make the tape float above the helical lead. The supply side guide roller is then rotated in the clockwise direction to flatten the ATR signal.	Take-up side guide roller rotated in counterclockwise direction (raises guide roller) to make the tape float above the helical lead. The take-up side guide roller is then rotated in the clockwise direction to flatten the ATR signal.

Figure 4-30.

③ Move the A/C head with the X value adjustment gear driver by the method shown in Figure 4-33, and adjust the A/C head so as to get the maximum ATR signal waveform. (Note: At this time adjust so as to get the maximum ATR signal waveform nearest the A/C head position which has been set in case of X value rough adjustment as stated in **4-17**, 3- ②.)
④ Adjust the playback switching point (Refer to the electric adjustment method.)
⑤ Playback the self-picture-recorded tape, and check the flatness of ATR signal waveform and sound.

Notes:
When the A/C head X value adjustment is performed, be sure to perform at first X value rough adjustment (refer to **4-17**, 3-②).

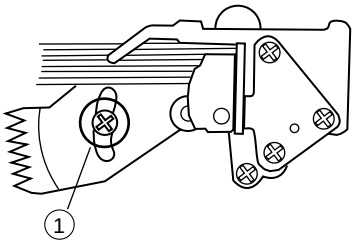


Figure 4-31.

4-18 REPLACEMENT OF THE CAPSTAN D.D. (DIRECT DRIVE) MOTOR

- Remove the mechanism from the set.

- **Removal (Follow the order of indicated numbers.)**

1. Unsolder loading motor wire and drum FFC.
2. Remove the reel belt ①.
3. Remove the three screws ②.

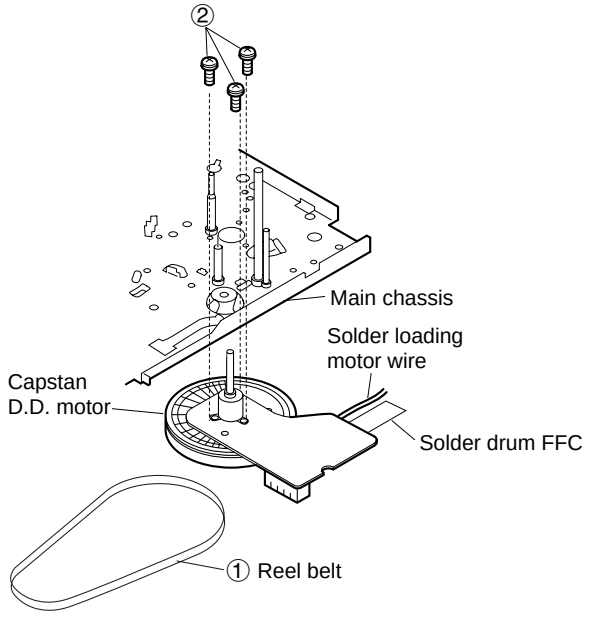


Figure 4-32.

- **Reassembly**

1. Taking care so that the capstan shaft does not contact the mechanism chassis, set its position on the mechanism chassis, and then install with the three screws.
2. Install the reel belt.
3. Solder loading motor wire and drum FFC.

Notes:

1. After installing the capstan D.D. motor, be sure to rotate the capstan D.D. motor and check the movement.
2. Set the tape, and check for the tape crease near the reverse guide in the playback mode. Adjust the A/C head and azimuth as stated in **4-17** item 2.

4-19 REPLACEMENT OF DRUM D.D. MOTOR

1. Set the ejection mode.
2. Withdraw the main power plug from the socket.

- **Removal (Perform in numerical order.)**

1. Disconnect the FFC cable ①.
2. Unscrew the D.D. stator assembly fixing screws ②.
3. Take out the D.D. stator assembly ③.
4. Unscrew the D.D. rotor assembly fixing screws ④.
5. Take out the D.D. rotor assembly ⑤.

Notes:

1. In removing the D.D. stator assembly, part of the drum earth spring pops out of the pre-load collar. Be careful not to lose it.
2. Install, so that the D.D. rotor ass'y and upper drum ass'y mounting direction check holes align. (Align the upper drum dent with the rotor hole.)
3. Be careful not to damage the upper drum or the video head.
4. Protect the hole elements from shock due to contact with D.D. stator or D.D. rotor ass'y.
5. After installation adjust the playback switching point for adjustment of servo circuit.

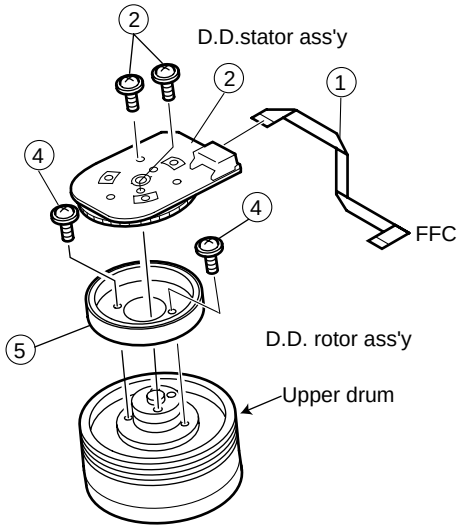


Figure 4-33.

4-20 REPLACING THE UPPER AND LOWER DRUM ASSEMBLY

• Replacement (Perform in the numerical order)
① Remove the motor as stated in **4-19** D.D. motor replacement.
② Remove the drum earth brush ass'y ②.
③ Remove the upper and lower drum assembly from main chassis ①.
④ Remove the drum FFC holder ③.

[Cares when replacing the drum]
1. Be careful so that the drum earth brush is not lost.
2. Do not touch directly the drum surface.
3. Fit gently the screwdriver to the screws.
4. Since the drum assembly is an extremely precise assembly, it must be handled with utmost care.
5. Make sure that the drum surface is free from dust, dirt and foreign substances.
6. After replacing the drum be sure to perform the tape running adjustment.
   After that, perform also the electrical adjustment.
   • Playback switching point adjustment
   • X-position adjustment and check
   • Standard and x-3 slow tracking adjustment
7. After replacing the drum clean the drum.

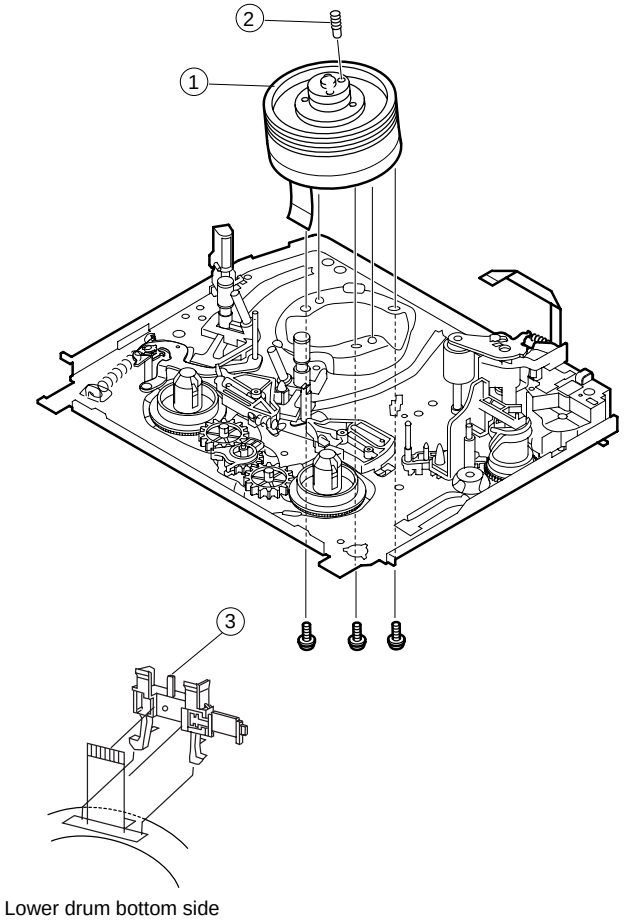


Figure 4-34.

4-21 ASSEMBLING OF PHASE MATCHING MECHANISM COMPONENTS

- **Assemble the phase matching mechanism components in the following order.**

1. Assemble the reverse guide lever and pinch drive cam.
2. Mounting the shifter (on the back of the mechanism chassis).
3. Mounting the master cam (on the back of the mechanism chassis).
4. Assemble synchro gear.
5. Assemble the loading motor parts.

• PINCH DRIVE CAM AND REVERSE GUIDE LEVER ASSEMBLING METHOD.

(Place the following parts in position in numerical order.)
(1)Pinch drive cam ①
(2)Reverse guide spring ②
(3)Reverse guide lever ass'y ③
(4)Open guide ④

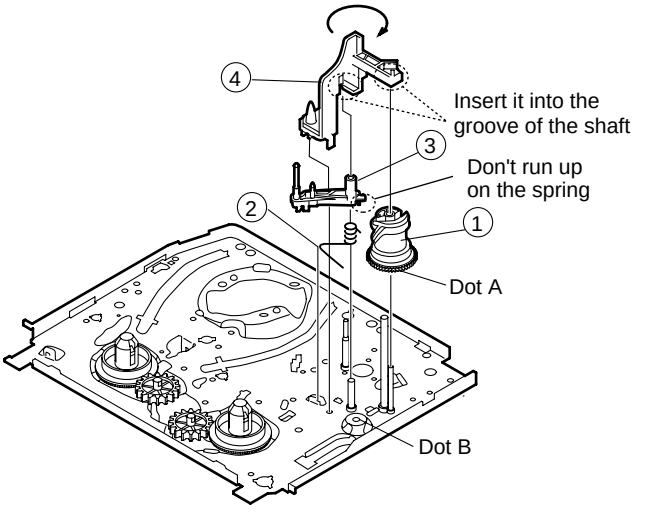
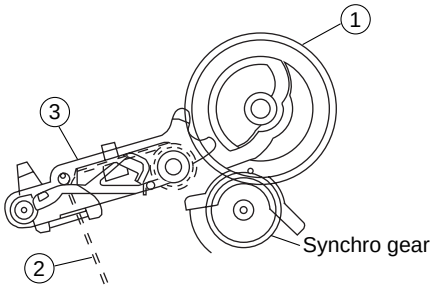
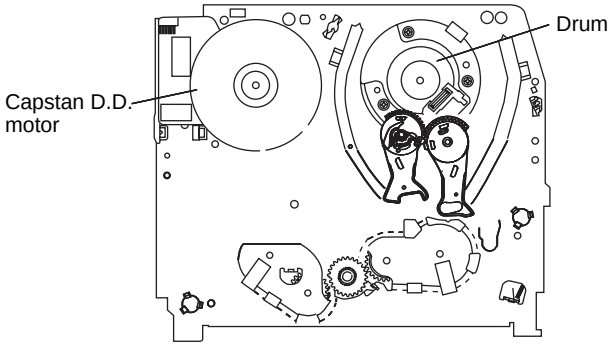


Figure 4-35.



From Top View

4-22 INSTALLING THE SHIFTER



(Bottom side of mechanism chassis)

Figure 4-36.

1. Make sure that the loading arm T and S are at the Phase-Matching point as shown below ⓐ.
2. Fix the shifter position setting part to the roading arm T position setting part as shown in figure ⓑ
3. Make sure tension arm not run on the shifter as shown in figure ⓒ.

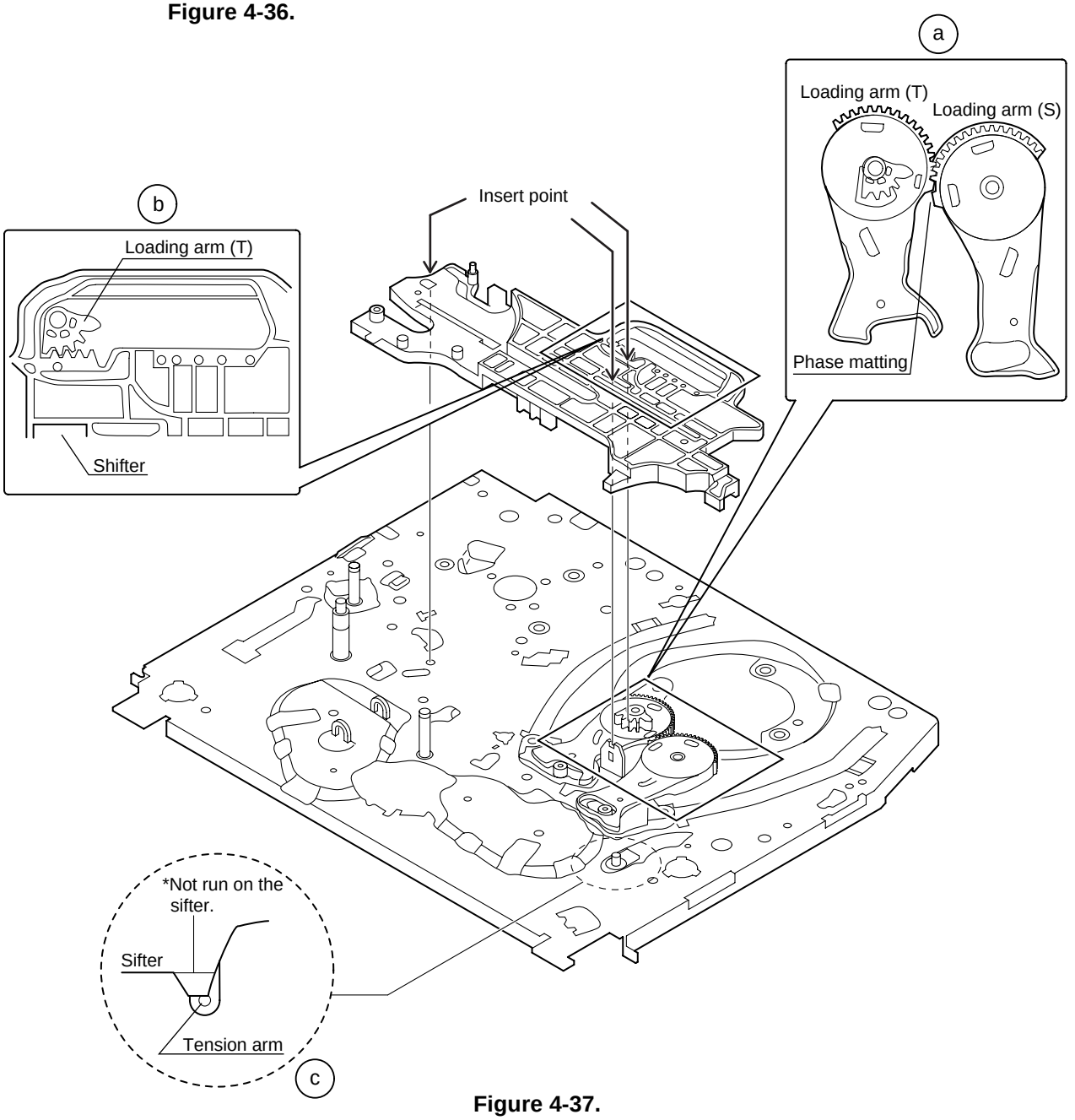


Figure 4-37.

4-23 INSTALLING THE MASTER CAM (AT REAR SIDE OF MECHANISM CHASSIS)

1. Make sure beforehand that the shifter is at initial position. (Right side from bottom view)
2. Place the master cam in the position as shown below.
3. Fix the E ring.

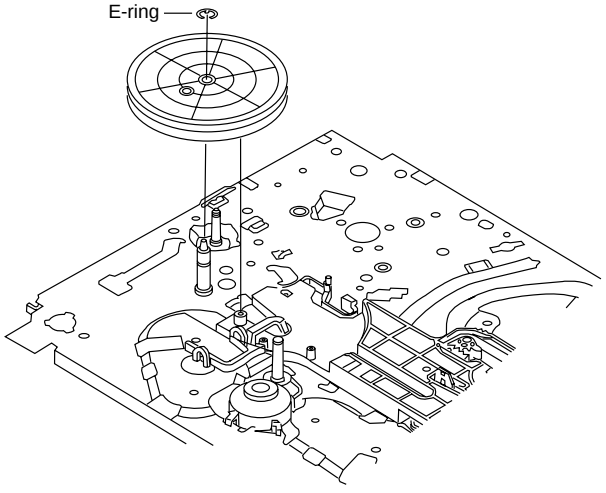


Figure 4-38-1.

4. Adjust the master cam and pinch drive cam, fix the synchro gear in correct position.

Note:
See the figure below for the phase matching between the master cam synchro gear and pinch drive cam.

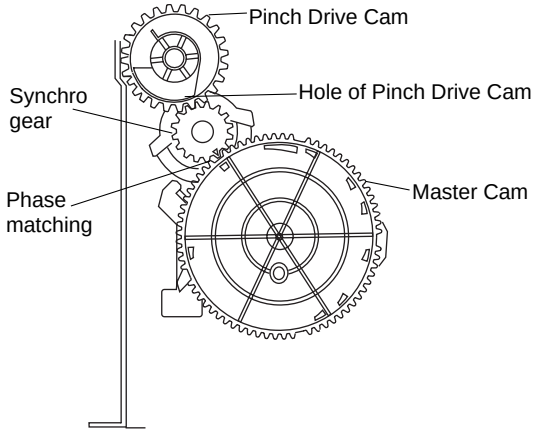


Figure 4-38-2.

4-24 REPLACEMENT OF LOADING MOTOR

- **Removal**

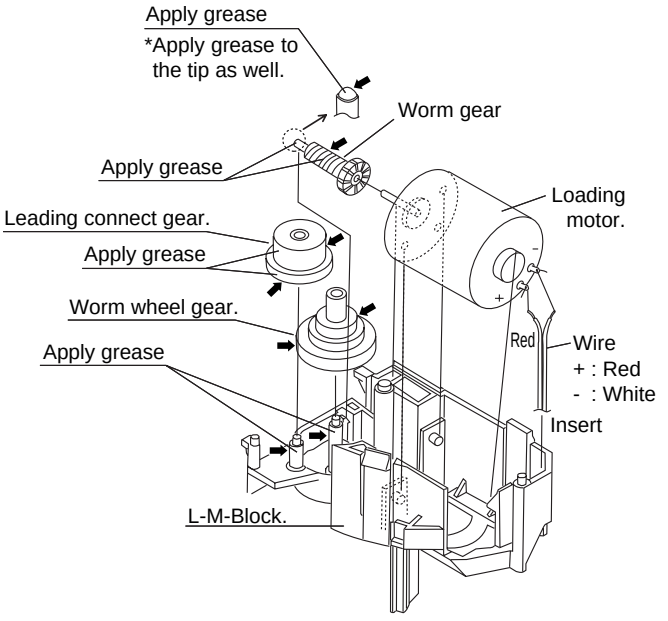


Figure 4-39.

- **Replacement**

Remove the loading motor, and install the replacement loading motor as shown below.

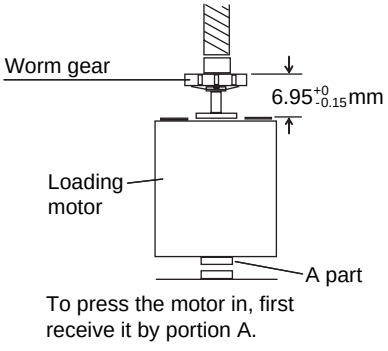
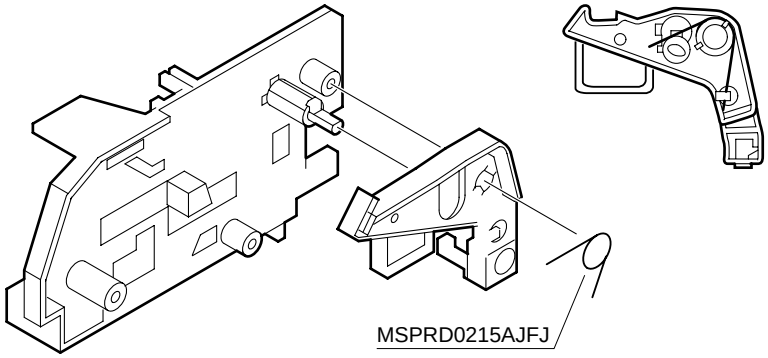


Figure 4-40.

The loading motor pressing-in must be less than 196N (20 kgf).
Adjust the distance between motor and pulley to 6.95 $^{+0}_{-0.15}$mm.

4-25 ASSEMBLY OF CASSETTE HOUSING

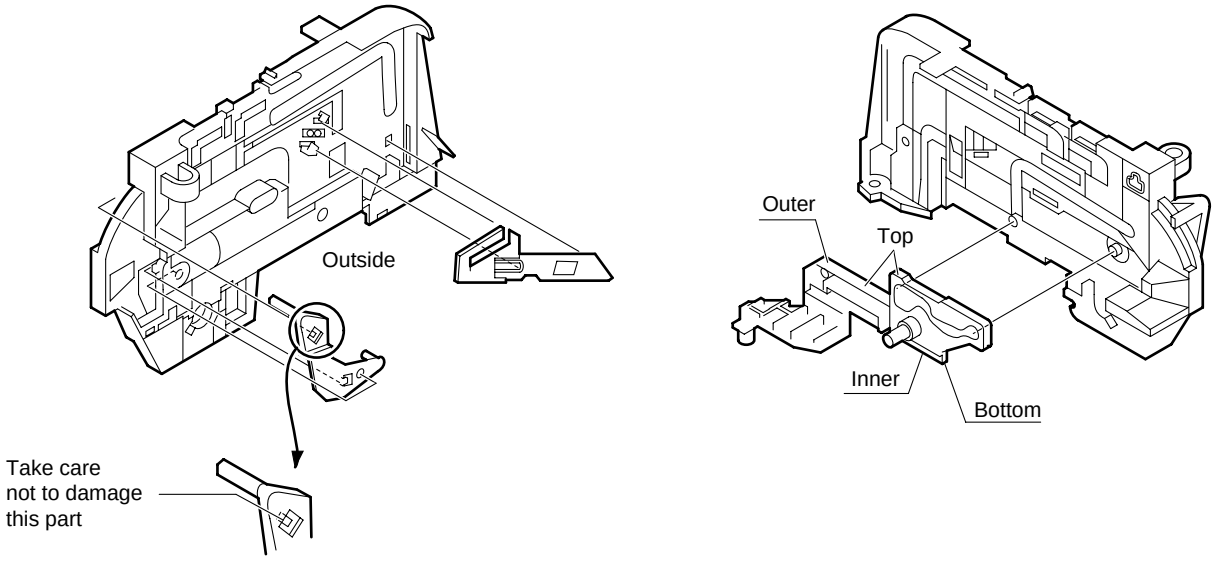
1. Proof lever Proof lever spring and Holder R



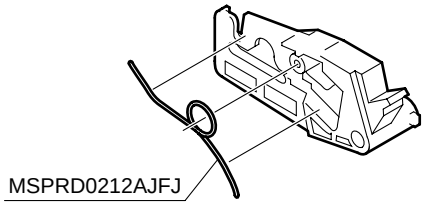
*Proof lever spring fixing direction designated.

Figure 4-41.

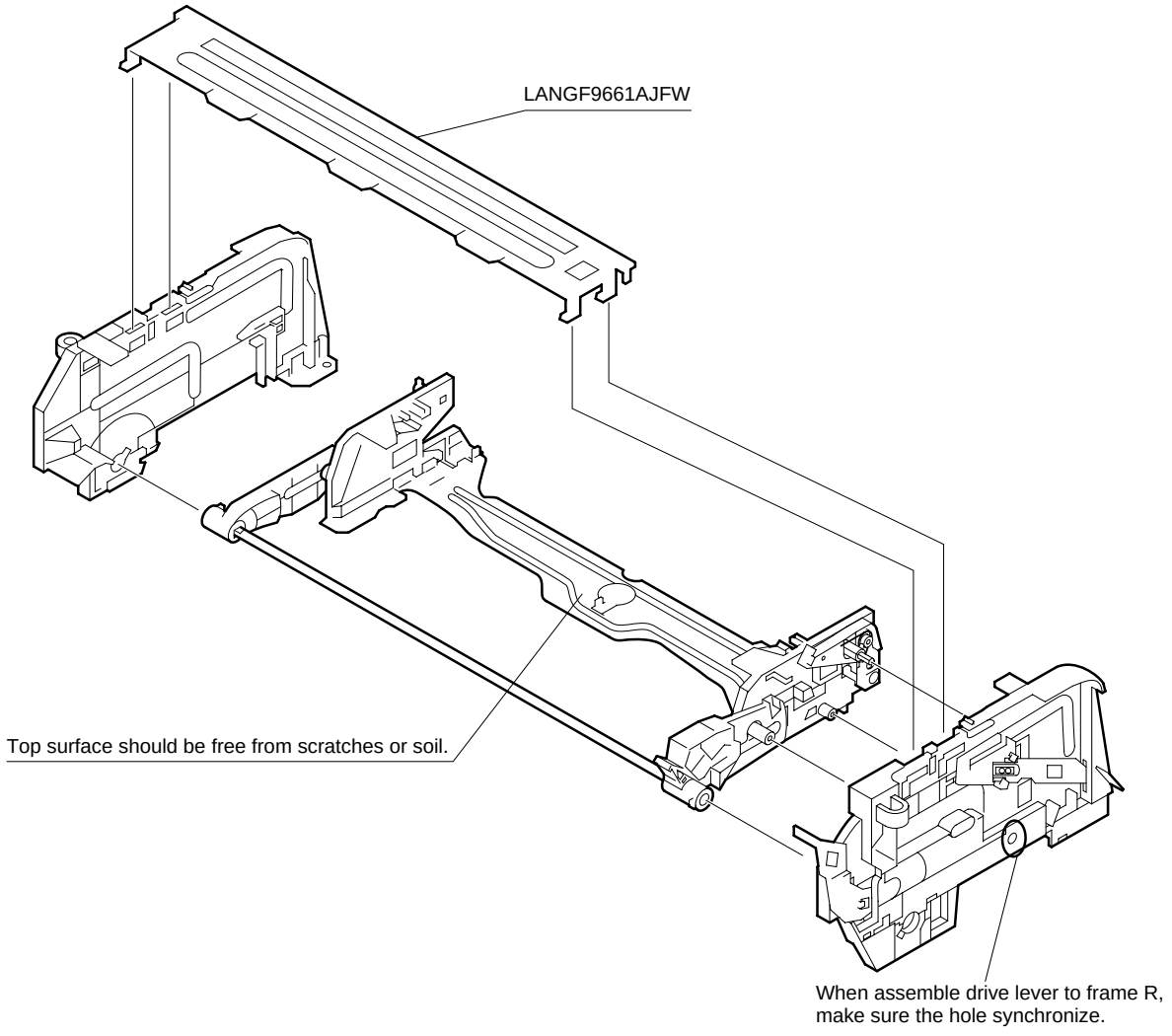
2. Open lever, Sensor Plate and Drive Lever to Frame R



3. Spring to Drive Arm R



4. Frame R, Frame L, Drive Arm R, Drive Arm L, Upper Plate.

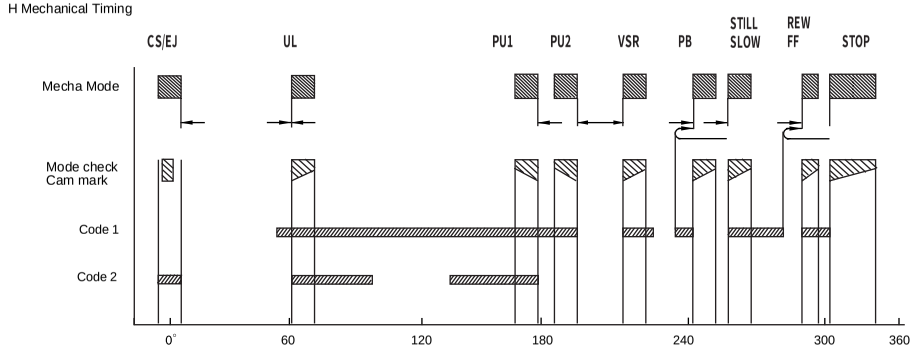

LANGF9661AJFW
Top surface should be free from scratches or soil.
When assemble drive lever to frame R, make sure the hole synchronize.

6. MECHANISM OPERATION FLOWCHART AND TROUBLESHOOTING GUIDE

MECHANISM OPERATION FLOWCHART

* This flowchart describes the outline of the mechanism's operation, but does not give its details.

H Mechanical Timing

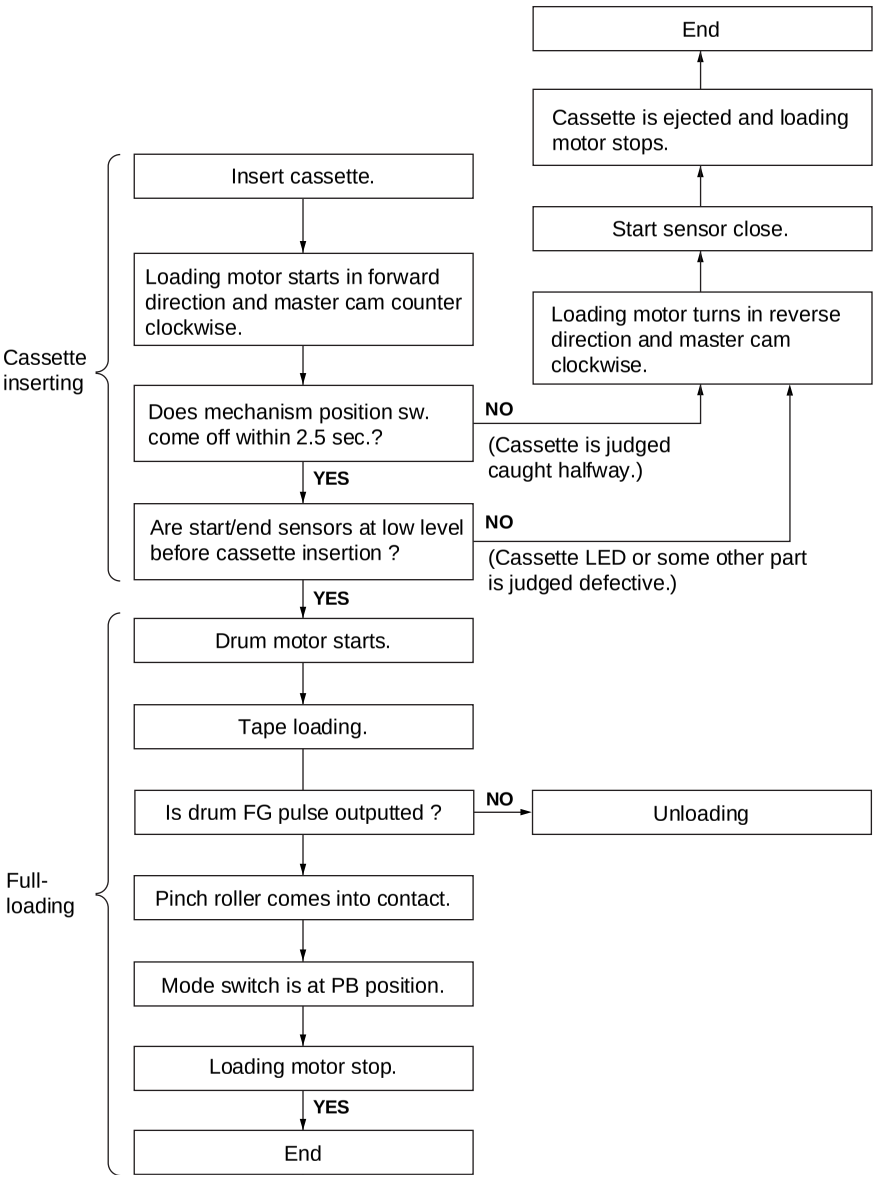


	EJ					UL				PU		PU2		VSR			PB		SLW			FF		STP
Code 1	0	0	0	0	0	1	1	1	1	1	1	1	1	0	1	1	0	1	0	0	1	1	0	1	1	0
Code 2	1	1	0	0	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S Sensor	1	1	0	1	1 or 0																					

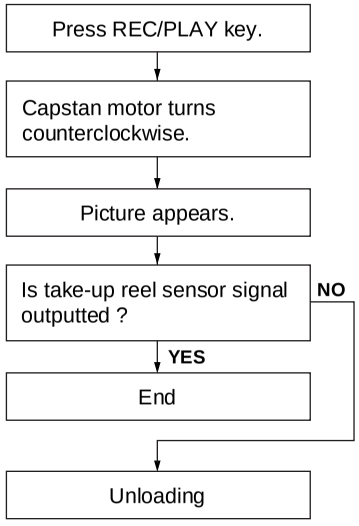
S Sensor: Open / Close

Mecha Mode	Code 1	Code 2
CS/EJ	0	1
ULD	1	1
PU1	1	1
PU2	1	0
VSR	1	0
PB	0	0
SLOW	1	0
FF	1	0
STOP	0	0

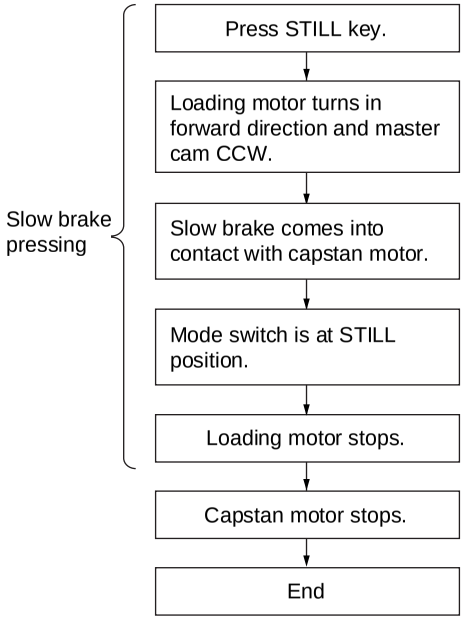
CASSETTE INSERTION → STOP


Insert cassette.
Loading motor starts in forward direction and master cam counter clockwise.
Does mechanism position sw. come off within 2.5 sec.?
NO
(Cassette is judged caught halfway.)
Loading motor turns in reverse direction and master cam clockwise.
Start sensor close.
Cassette is ejected and loading motor stops.
End
YES
Are start/end sensors at low level before cassette insertion ?
NO
(Cassette LED or some other part is judged defective.)
YES
Cassette inserting
Drum motor starts.
Tape loading.
Is drum FG pulse outputted ?
NO
Unloading
Pinch roller comes into contact.
Mode switch is at PB position.
Loading motor stop.
YES
End
Full-loading

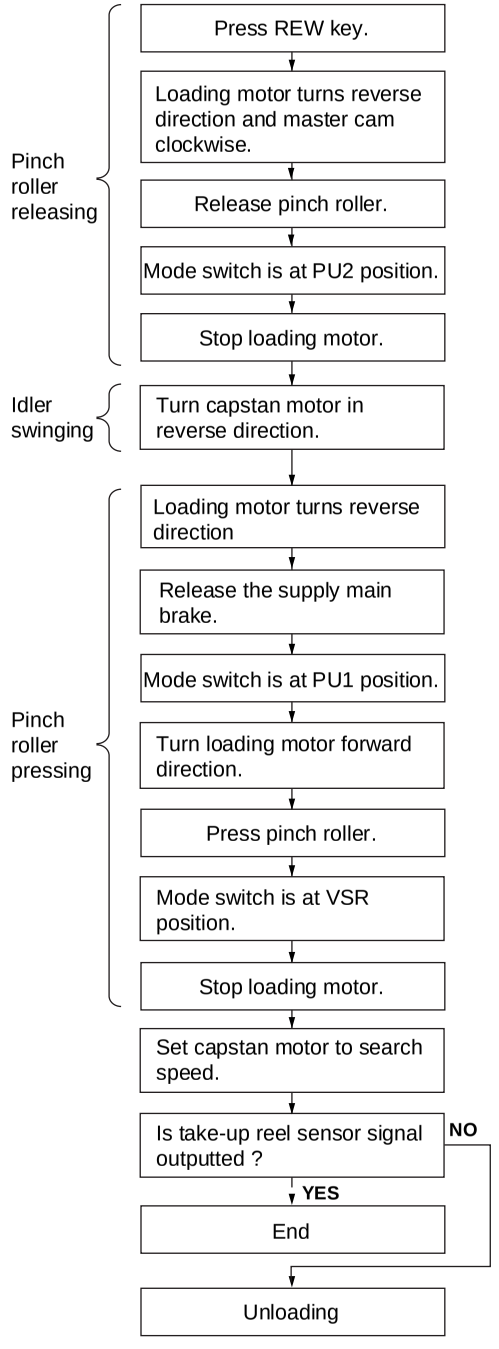
STOP → REC/PLAY



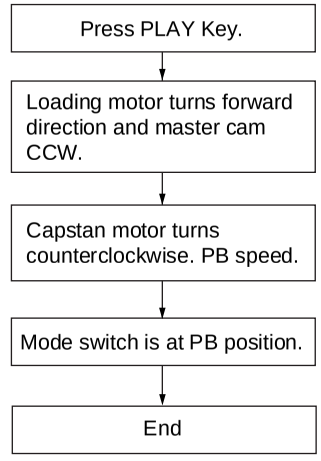
PLAY → STILL


Slow brake pressing
Press STILL key.
Loading motor turns in forward direction and master cam CCW.
Slow brake comes into contact with capstan motor.
Mode switch is at STILL position.
Loading motor stops.
Capstan motor stops.
End

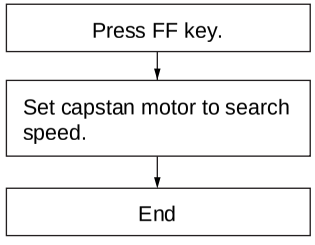
PLAY → VSR


Pinch roller releasing
Idler swinging
Pinch roller pressing
Press REW key.
Loading motor turns reverse direction and master cam clockwise.
Release pinch roller.
Mode switch is at PU2 position.
Stop loading motor.
Turn capstan motor in reverse direction.
Loading motor turns reverse direction
Release the supply main brake.
Mode switch is at PU1 position.
Turn loading motor forward direction.
Press pinch roller.
Mode switch is at VSR position.
Stop loading motor.
Set capstan motor to search speed.
Is take-up reel sensor signal outputted ?
NO
YES
End
Unloading

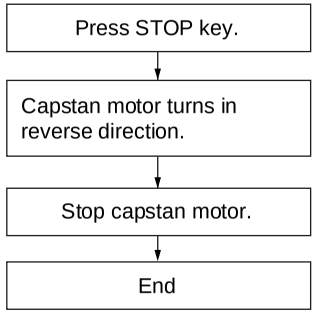
VSR → PLAY


Press PLAY Key.
Loading motor turns forward direction and master cam CCW.
Capstan motor turns counterclockwise. PB speed.
Mode switch is at PB position.
End

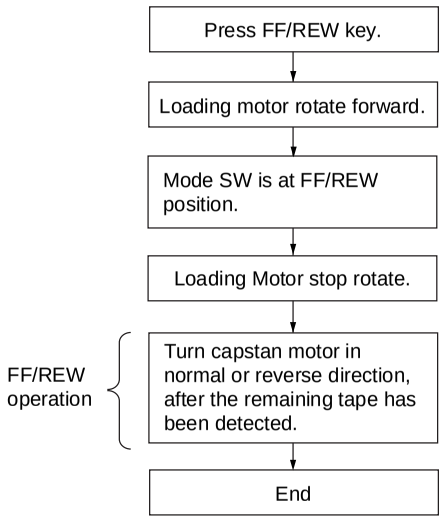
PLAY → VSF



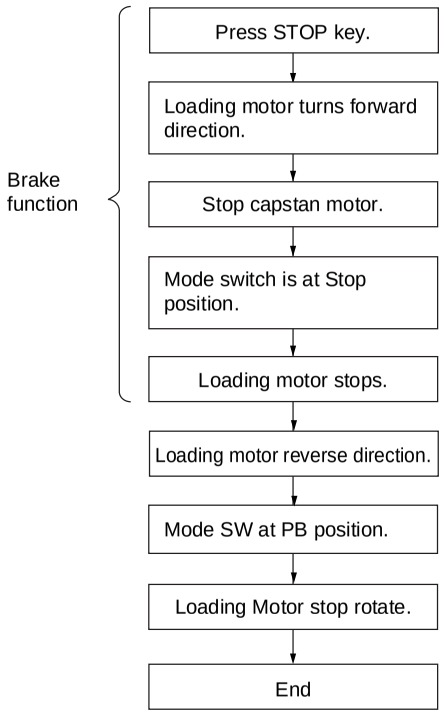
REC/PLAY → STOP



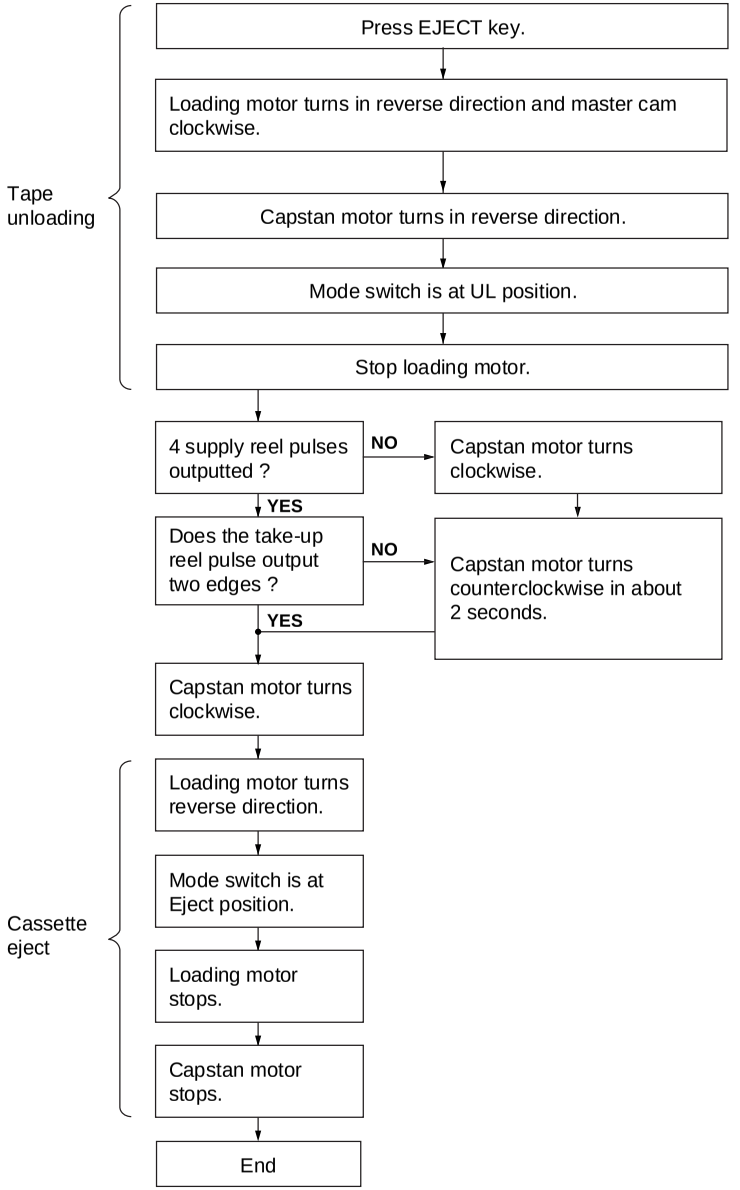
STOP → FF/REW


Press FF/REW key.
Loading motor rotate forward.
Mode SW is at FF/REW position.
Loading Motor stop rotate.
FF/REW operation
Turn capstan motor in normal or reverse direction, after the remaining tape has been detected.
End

FF/REW → STOP



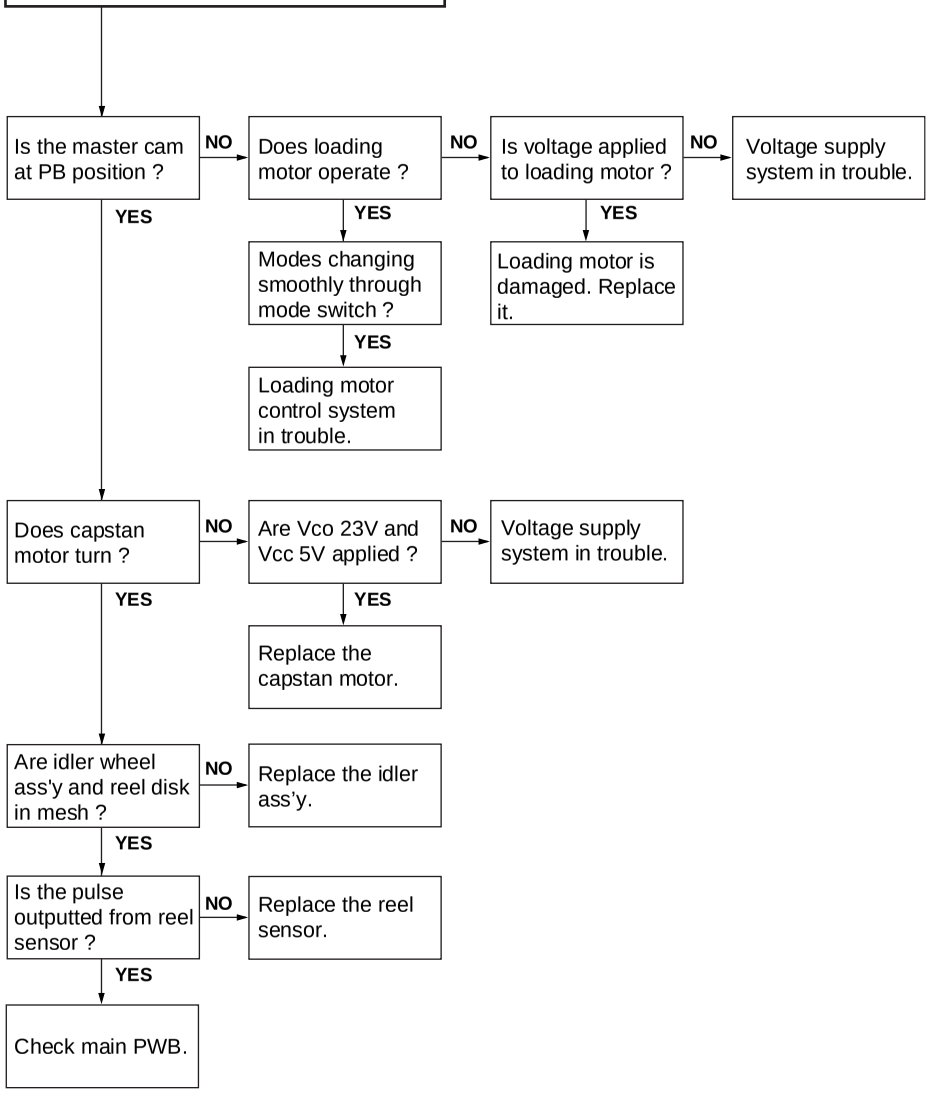
STOP → CASSETTE EJECT


Press EJECT key.
Loading motor turns in reverse direction and master cam clockwise.
Tape unloading
Capstan motor turns in reverse direction.
Mode switch is at UL position.
Stop loading motor.
4 supply reel pulses outputted ?
NO
Capstan motor turns clockwise.
YES
Does the take-up reel pulse output two edges ?
NO
Capstan motor turns counterclockwise in about 2 seconds.
YES
Capstan motor turns clockwise.
Loading motor turns reverse direction.
Cassette eject
Mode switch is at Eject position.
Loading motor stops.
Capstan motor stops.
End

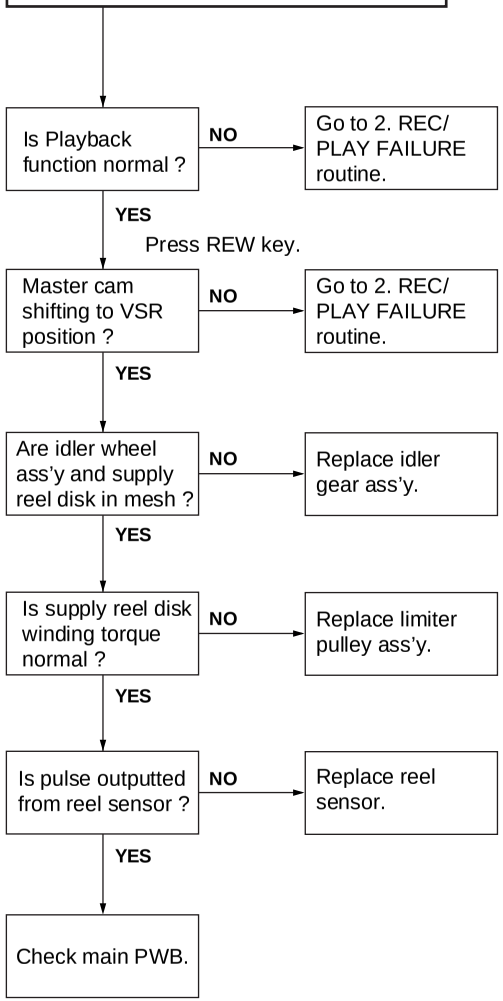
MECHANISM TROUBLESHOOTING

1. FF/REW FAILURE (NO TAPE WINDING)

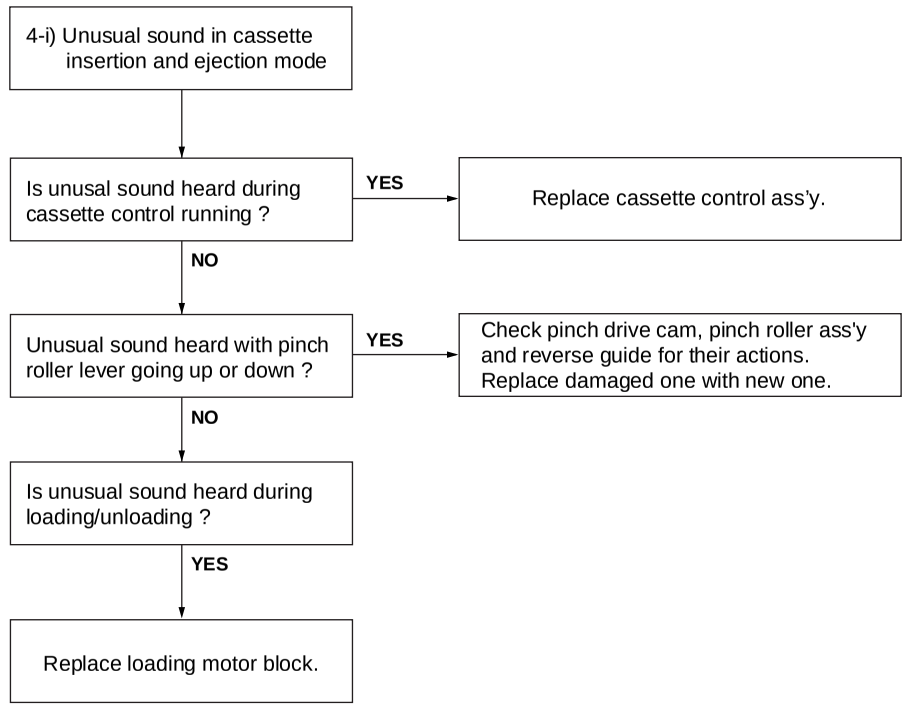
2. REC/PLAY FAILURE (MODE RELEASE)

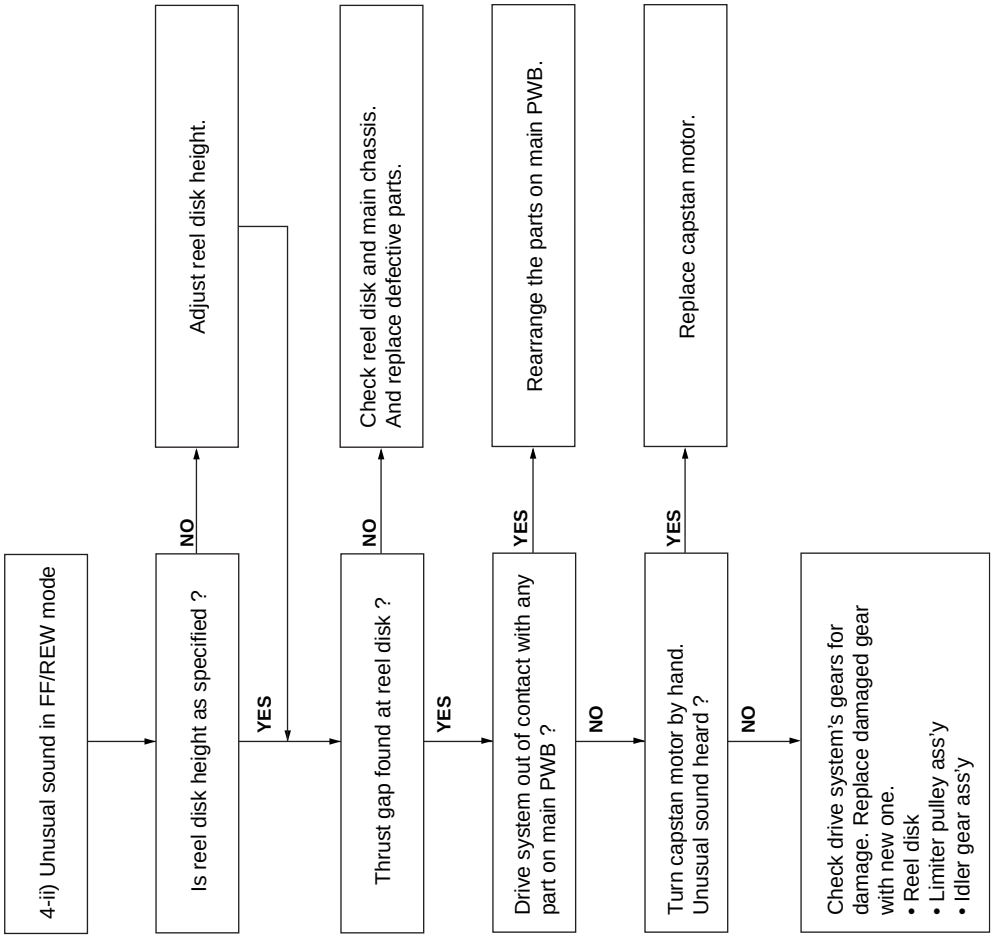


3. WINDING FAILURE AT VSR



4. UNUSUAL SOUND IN EACH MODE


4-i) Unusual sound in cassette insertion and ejection mode
Is unusal sound heard during cassette control running ?
YES
Replace cassette control ass'y.
NO
Unusual sound heard with pinch roller lever going up or down ?
YES
Check pinch drive cam, pinch roller ass'y and reverse guide for their actions. Replace damaged one with new one.
NO
Is unusual sound heard during loading/unloading ?
YES
Replace loading motor block.


4-ii) Unusual sound in FF/REW mode
Is reel disk height as specified ?
NO
Adjust reel disk height.
YES
Thrust gap found at reel disk ?
NO
Check reel disk and main chassis.
And replace defective parts.
YES
Drive system out of contact with any part on main PWB ?
YES
Rearrange the parts on main PWB.
NO
Turn capstan motor by hand.
Unusual sound heard ?
YES
Replace capstan motor.
NO
Check drive system's gears for damage. Replace damaged gear with new one.
• Reel disk
• Limiter pulley ass'y
• Idler gear ass'y

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